Alvyra Galkienė
Ona Monkevičienė   *Editors*

Improving Inclusive Education through Universal Design for Learning

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Inclusive Learning and Educational Equity

Volume 5

Aims and Scope:

This book series reflects on the challenges of inclusive education as a strategy for improving educational equity. The series addresses issues of diversity in support of the UN Sustainable Development Goals (SDGs) which set the global education agenda for 2030 in SDG 4: Ensure inclusive and quality education for all and promote lifelong learning.

Although considered an important aspect of a global human rights agenda ensuring education for all is a complex endeavour that is subject to the forces of globalization, and the exclusionary pressures associated with migration, mobility, language, ethnicity, disability, and intergenerational poverty. Acknowledgement of the reciprocal links between these markers of diversity and educational underachievement has led to an increasing interest in the development of inclusive education as a strategy for improving educational equity.

By addressing these and related diversity issues, this series aims to contribute important advances in knowledge about the enactment of inclusive education. The development of educational processes and pedagogical interventions that respond to the tensions between education policies that promote competition and those designed to promote inclusion at individual, classroom, school, district, national, and international levels are explored by the contributors to this series.
This series:

- Offers a critical perspective on current practice.
- Stimulates and challenges further developments for the field.
- Explores global disparities in educational provision and compares developments.
- Provides a welcome addition to the literature on inclusive education.

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Alvyra Galkienė • Ona Monkevičienė
Editors

Improving Inclusive Education through Universal Design for Learning

🐎 Springer

Editors
Alvyra Galkienė (iD)
Educational Aacademy
Vytautas Magnus University
Kaunas, Lithuania

Ona Monkevičienė (iD)
Educational Aacademy
Vytautas Magnus University
Kaunas, Lithuania

Preface

The European Agency for Special and Inclusive Education[1] expressed the commitment of all European countries to developing more inclusive education systems, which aim to ensure that all learners of any age are provided with meaningful, high-quality educational opportunities in their local community. Although the indicators of inclusive education quality are related to individual success and the high achievements of every learner, the conditions for achieving these results are predetermined by the processes that occur at all levels of the inclusive education ecosystem, that is, from education policy makers' decisions to educational practices at school. Therefore, contextualisation of inclusive education in the cultural and educational experience of various countries allows identification of the universal factors that are also of significance to inclusion quality.

The research presented in this scientific study continues the search for the factors that are significant for the high-quality implementation of inclusive education. The previous analysis on the good practice of inclusive education in four European countries[2] allowed revealing the existing factors that promote the good practice of inclusive education in four countries with different socio-cultural and political development experiences, that is, in the contexts of Lithuania, Poland, Austria and Finland. During the research, the recognition of a person's individuality and prioritisation of their strengths were identified as the epistemological goal and the reference point in inclusive education.

The research presented in this book links the application of the Universal Design for Learning (UDL) approach with research on possibilities for enriching the already existing educational practices of inclusive education, thus providing teachers with more tools for achieving the efficiency of education. The research was carried out in the contexts of the same aforesaid countries that participated in the research. The

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[1] European Agency for Special and Inclusive Education. Position on Inclusive Education Systems. Retrieved from https://www.european-agency.org/sites/default/files/PositionPaper-EN.pdf

[2] Galkienė, A. ed. (2017). *Inclusion in socio-educational frames: inclusive school cases in four European countries*. Vilnius: Publishing house of the Lithuanian University of Educational Sciences. https://www.vdu.lt/cris/bitstream/20.500.12259/98800/1/ISBN9786094710995.pdf

researchers from Vytautas Magnus University (Lithuania), the University of Vienna (Austria), the University of Lapland (Finland) and Krakow Pedagogical University (Poland), in turn, included one school that implements inclusive education in their country and is willing to develop its education system.

As the educational system that is based on scientific evidence focuses on all learners' success and provides specific guidelines for its implementation, the UDL approach was chosen for improvement of inclusive education. Before planning of the research, the group of project participants held a meeting with specialists from CAST organisation. The mission of this non-governmental organisation is "to transform education design and practice until learning has no limits".[3] This idea was very much in line with the goal of the project participants to search for educational methods that are favourable to the success of all learners. During the meetings of educational researchers, teachers implementing inclusive education and UDL specialists, the specifics of the UDL approach was analysed. The participants also shared ideas about implementing this approach in different educational, cultural and educational practice contexts. Later, the national teams made up their decisions regarding actualisation of the educational component and its development applying the UDL approach in the context of their own country. The group from Krakow Pedagogical University and the school "Zespol Szkol Ogolnoksztalcacych nr 9 w Krakowie" decided to enrich the process of education in the classroom. The team from Vytautas Magnus University and Vilniaus Balsių Progymnasium put emphasis on the perspective of the pupil's becoming an expert learner. The group from the University of Lapland and the school of Aleksanteri Kenan koulu chose to focus on the problem of developing teacher competences while applying the UDL approach. The group of researchers from the University of Vienna and teachers from Schulzentrum Donaustadt arrived at a decision to re-interpret the educational system applied in the school in the context of the UDL approach, as well as to identify the areas to be improved in the educational system and to distinguish the elements of UDL to be developed, seeking to better apply this approach in various educational contexts. The method of action research, which is considered to be favourable for the analysis and development of existing practices, was chosen for this research.

In the introductory chapters of this book, the reader will find the insights supported by the results of previously conducted research, which relate to the processes of inclusive education transformations, interpretation of the UDL conception and discussion about a new attitude towards uniqueness of pupils, the analysis of differences in education differentiation approaches, and peculiarities of formulating goals and their achievement within the UDL approach. The book presents a comprehensive overview of the methodology of action research and its application while conducting research on educational processes according to the approaches suggested by different authors.

Analysing the results of the empirical research, the reader will find two directions in the insights. On the one hand, the results of the research carried out in

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[3] CAST website: http://www.cast.org/about/about-cast

different educational and cultural contexts approaching the problem from various perspectives allow for a deeper learning of inclusive education experiences and contextualised realities in the four European countries. On the other hand, evaluation of possibilities for applying the UDL approach while improving the already functioning educational practices makes it possible to identify and acknowledge valuable elements of this approach, favourable factors for its integration into the operating systems and system transformations, as well as encountered obstacles.

The analysis of educational practice while implementing the UDL approach in Poland disclosed the phasing of change mechanisms in the transition from routine, learning difficulties-centred teaching to flexible, reflective teacher-moderated learning that emphasises coping with barriers. The research showed the transformative effect of pupils' experienced success on the change in the teachers' attitudes, motivation and dispositions. The results of the research conducted in the chosen Polish school highlighted the impact of collaboration of the researchers' tutoring on stronger teacher motivation and self-efficacy, engaging in the change processes and implementing new experiences in own practice. The mastered methodology of the UDL approach increases the confidence of teachers and pupils in the success of changes and helps them to move from the status quo and to cope with challenges provoked by unexpected circumstances.

The results of the research on the pupil becoming an expert learner showed that the UDL guidelines, their structure and recommendations for implementation provide pupils with an educational direction while gaining qualities that are significant to an expert learner. The research results allowed for differentiating the factors that predetermine the pace and quality of this process development. This also contributed to determining the important components of this becoming, which manifest themselves differently in various contexts of educational experience. The underresearched pupils' abilities were revealed: to understand how emotions support thinking, to participate in the process of creating collective understanding and to become co-creators of a universal learning environment.

The research on the development of teacher inclusive competences in Finland was conducted through teachers' implementation of UDL principles in the school's educational practice, at the same time reflecting on their own competences needed for this process. The Multidimensional Adapted Process Model of Teaching (MAP), acknowledged in Finland, was applied for reflection on competences. This enabled the participants to approach the development of inclusive competences from two perspectives: UDL and MAP. It was established that the teacher competences included in the MAP were in line with the practices based on UDL, defining the concept of competences necessary for inclusive education.

An innovative Austrian approach to applying the UDL principles for the development of well-established inclusive education practice highlighted opportunities for the school community to identify "blind" spots of coping with educational barriers as well as new variants of interpreting the applied means and methods oriented towards the goals of school's sustainable development. The ways to apply the UDL approach for re-interpretation of the existing problems, finding a solution to the problem of balancing the successful functioning of all learners in the common open

environment are discussed. The ways to encourage pupils to be co-authors of their own learning environments and navigators of their own learning process were disclosed. Re-interpreting the inclusive education practices that already exist in their schools, teachers approach them from two perspectives, that is, through the prism of differentiated instruction and the creation of a universal education environment.

In the summary, the reader will be provided with a holistic model for UDL application. It is designed to consider the results of research on applying the UDL approach in different educational cultural contexts while analysing different UDL perspectives and aiming at identifying factors that are significant to the development of inclusive education.

Vytautas Magnus University, Educational Aacademy   Alvyra Galkienė
Vilnius, Lithuania   Ona Monkevičienė

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Contents

Contributors

Jolanta Baran Pedagogical University of Krakow, Krakow, Poland

Gottfried Biewer University of Vienna, Vienna, Austria

Tamara Cierpiałowska Pedagogical University of Krakow, Krakow, Poland

Ewa Dyduch Pedagogical University of Krakow, Krakow, Poland

Alvyra Galkienė Educational Aacademy, Vytautas Magnus University, Kaunas, Lithuania

Gertraud Kremsner University of Vienna, Vienna, Austria

Outi Kyrö-Ämmälä University of Lapland, Rovaniemi, Finland

Suvi Lakkala University of Lapland, Rovaniemi, Finland

Ona Monkevičienė Educational Aacademy, Vytautas Magnus University, Kaunas, Lithuania

Julita Navaitienė Educational Aacademy, Vytautas Magnus University, Kaunas, Lithuania

Rasa Nedzinskaitė-Mačiūnienė Vytautas Magnus University, Kaunas, Lithuania

Michelle Proyer University of Vienna, Vienna, Austria

Gerda Šimienė Vytautas Magnus University, Kaunas, Lithuania

Eglė Stasiūnaitienė Educational Academy, Vytautas Magnus University, Kaunas, Lithuania

Chapter 1
Preconditions of Transforming the Educational Process by Applying Inclusive Education Strategies: Theoretical Background

Alvyra Galkienė and **Ona Monkevičienė**

Abstract The experience of the development of inclusive education strategies in various countries has been the source of various conceptions and practices, which have gradually evolved into the axis of the education policy of the late twentieth and early twenty-first century. This chapter presents an overlook of insights that are significant for the practical implementation of inclusive education and substantiated by scientific research. As the perception of inclusive education developed from meeting special educational needs in general schools (Florian. Int J Incl Educ 23(7–8): 691–704. https://doi.org/10.1080/13603116.2019.1622801, 2019) to recognising the variety of needs of all students (Meyer et al. Universal design for learning: theory and practice. CAST, 2014), the Universal Design for Learning (UDL) approach was presented to the pedagogical circles. This chapter of the book examines the fundamental aspects of the UDL approach in the context of the development of the inclusive education construct, from emphasising the Zone of Proximal Development (Vygotsky. Thought and language. MIT Press, 1962) to highlighting the processes taking place in the inclusive education ecosystem (European Agency for Special Needs and Inclusive Education. Inclusive school leadership: exploring policies across Europe. (E. Óskarsdóttir, V. Donnelly & M. Turner-Cmuchal, Eds.). Odense, Denmark. https://www.european-agency.org/sites/default/files/sisl_synthesis_report.pdf. Retrieved 16 April 2021, 2019), revealing the variety of perceptions of student uniqueness and education differentiation concepts in implementing inclusive education, and discussing the differences between the specificities of education goals and their implementation in the UDL and traditional approaches. The analysis of scientific research allowed us to distinguish the basic aspects of the UDL approach that are significant for the transformation of the traditional education system into a high-quality one based on the presumptions of success for every student and formed on the grounds of inclusive education.

A. Galkienė (✉) · O. Monkevičienė
Educational Academy, Vytautas Magnus University, Kaunas, Lithuania
e-mail: alvyra.galkiene@vdu.lt; ona.monkeviciene@vdu.lt

1.1 Transformational Aspects of Inclusive Education

Inclusive education processes, begun alongside society's movement for the recognition of dignity and equal rights for all its members (Salend & Garrick Duhaney, 2011), are, nevertheless, not the result of paradigm revolutions but rather of consistent societal evolution (Magnússon et al., 2019). However, it is not an automatic process. Inclusive education gains ground in school practices when it becomes a state priority sustained by solid, clear, and unambiguous national support and a unified perception of the phenomenon (Haug, 2020). The perception of inclusive education determines not only the characteristics of the education system but also the fate of the educated. As Ramberg and Watkins (2020) put it, major differences exist between European countries in terms of students' access to their right to inclusive education. In many cases, it is determined by the variety of conceptual education systems.

When analysing inclusive education concepts that serve as the basis for educational systems and the taxonomy of their development, it is worthwhile to remember the ideas of L. Vygotsky, born from pondering ways to help almost 7 million children suffering psychological trauma or physical injuries during World War I (Smagorinsky, 2012). Vygotsky (1993) defines two types of reasons limiting the quality development of a child with disability. These are primary reasons arising from biological differences in the body and secondary reasons stemming from the primary ones due to unfavourable social and cultural context restricting the social and cultural participation of the child with different needs and his or her possibility to realise his or her own potential: 'A physical defect somehow causes a social dislocation' (Vygotsky, 1993, p. 76). The analysis of contrasting education systems developed on the grounds of the ideas of Vygotsky allows a deeper understanding of the conceptual foundation of inclusive education, its development, and expression in the differing social and cultural contexts of different countries (Fig. 1.1).

Corrective Educational Model Although Vygotsky, when considering matters of education, never mentioned the concept of inclusion, he built the foundation for it by modelling education on the interaction of the person and their social and cultural environment, by linking the quality of life to reducing 'social displacement', and by criticising the corrective education model as well as the development of closed institutions based on this model. In Vygotsky's opinion (1924), it is necessary to recognise the powers of students with disabilities and cultivate them as the powers of all the other students are cultivated by eliminating the secondary reasons hindering the child's development. Society should create conditions favourable for the learning and educational as well as social and cultural participation of these students together with others, thus preparing them for the future of an employed adult.
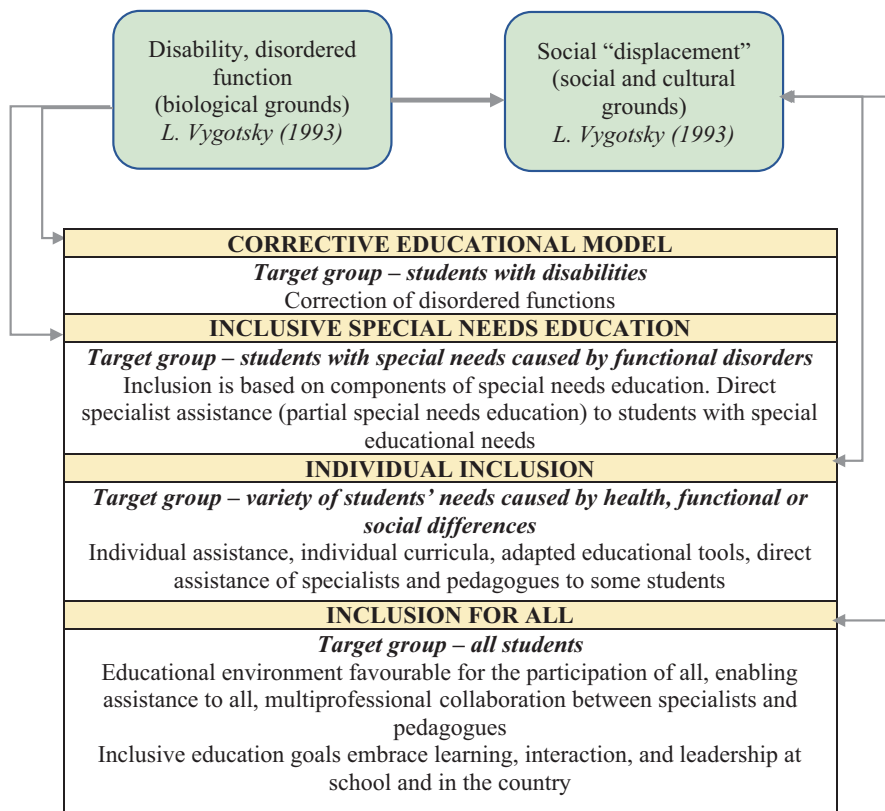
Fig. 1.1 Taxonomy of inclusive education

Despite Vygotsky's inclusive ideas, the corrective educational model was nevertheless vastly developed in the Soviet Union, following the main idea of overcoming or reducing the disorder and its consequences to the minimum, thus providing possibilities for the person to engage in public social and cultural life. Therefore, society itself adopted philanthropic roles, developing networks of specialised schools and jobs, and distributing support to people with disabilities (Smagorinsky, 2012).

Inclusive Special Needs Education After the Universal Declaration of Human Rights (UN General Assembly, 1948), an agreement to guarantee equal rights for all, attention was focused on the situation of individuals with disabilities in the system of education. It is natural that the system of special needs education (Qu, 2020), which was constructed following the prevailing medical approach to disability, was relocated to the system of general education. Hornby (2015) describes and bases this phenomenon on the concept of 'inclusive special needs education'. It is a practice targeted exclusively at students with special educational needs (SEN), based on the components of special needs education. Specialised schools are recognised as a

more appropriate environment for the education of students with special educational needs (Buchner et al., 2021). The competency of the pedagogues is linked to special needs education. When considering the preconditions for the quality education of these students, the feasibility of sufficient competency development in general education teachers is questioned; therefore, the education of these students is entrusted to special needs teachers. Takala et al. (2009), having analysed the implementation of inclusive special needs education in Finland, when special needs teachers educate students with special educational needs in their separate rooms, conclude that such a model of education organisation is not favourable for developing inclusive education. Hornby (2015) notes that the concept of inclusive special needs education sees the inclusion of students as the goal of education, yet postpones its realisation for the future, after the graduation. Although the concept of inclusive special needs education includes the idea of inclusive education, the education is nevertheless designed based on disability and developmental disorders (Fig. 1.1).

Individual Inclusion After the world community agreed on the conception of inclusive education and this agreement was enshrined in the Salamanca Statement (UNESCO, 1994), inclusive education has become an educational policy effort in many countries (Ainscow, 2020). The concept of inclusion is expanded to include not only students with disabilities and functional disorders but also those facing difficulties due to differences resulting from their linguistic, cultural or social conditions. However, the conception of this education strategy, methodologies, and ways of its implementation to a great extent depend on the political, experiential, and cultural context of the country and are in the constant process of transformations. International research shows that in most European countries, inclusive education is identified with the teaching of SEN students in schools of general education (European Agency for Special Needs and Inclusive Education, 2019). However, the relationship between general education and special needs education still remains a problem (Magnússon et al., 2019; Florian, 2019). When students with different abilities and needs learn together with others, yet different forms or content of education are applied individually, or alternative curricula are used for 'some' students, this shapes experiences of stigmatisation and internal exclusion (Florian & Black-Hawkins, 2011). The current practice shows and the conducted research proves that the system of education, where the interaction between general and special needs education is not sufficiently balanced, tends to generate internal problems, such as incompliance between educational goals, curriculum, and students' abilities; in some cases, students' and teachers' negative attitude towards SEN students; difficulties related to their acceptance to the community; and problems of self-perception and self-assessment encountered by SEN students (Spencer & Laurel, 2011). International research results show that the application of alternative curricula for students with special educational needs becomes an obstacle to their involvement and participation in the common educational experience (Hanreddy & Östlund, 2020). Moreover, teachers encounter difficulties in differentiating educational content and implementing it individually for 'some' students (Westbroek et al., 2020).

Inclusion for All   The ideas of Booth and Ainscow (2002) saturated the conception of inclusive education with the priority of an inclusive education culture and emphasised the equal value of every student and staff member. This culture embraces not only interpersonal relations but also educational policy and practice. It is based on the principles of justice in education, the presence of which in a school, according to Ainscow and Hargreaves (2016), depends on numerous processes that reach the school from outside. Haug (2020) states that the consolidation of the position of inclusive education and justice in education relies on the development of inclusive culture and values directly in schools and the closest relationships around and indirectly—in the educational policy, when inclusive culture is acknowledged as a national priority.

The Global Education Monitoring Report 2020 (UNESCO, 2020) highlights the perception of inclusion that emerged in the fight of people with disabilities for their right to inclusive education, which continues to be linked to people with disabilities. However, inclusion is a phenomenon with a much broader scope. The same educational practice should involve not only people with disabilities but everybody, regardless of their age, gender, race, social, or ethnic background, place of residence, economic status, language, religion, sexual orientation, migration, and other circumstances. When implementing inclusion for all, one must acknowledge the signs of inequality and make an effort to eliminate them. One of these is the concept of 'special needs', which emphasises people's normality and deviations from the norm. In the perception of inclusion for all, this concept should be replaced by 'participation and obstacles to learning'.

However, when pursuing an inclusive and quality implementation of inclusion for all, it is obligatory to find solutions for students with mental disorders, most of whom still attend specialised schools (Buchner et al., 2021), principles of joint operation of specialists and teachers in building a flexible learning environment (Takala et al., 2009), and to eliminate obstacles for equal participation of all students (Ramberg & Watkins, 2020).

The study 'Improving Inclusive Education Through a Universal Design for Learning' looks into the issue of improving inclusive education in the context of four European countries that all strive for a good quality inclusive education, yet have different social, cultural, and educational experiences and historic memory. The development of inclusive education began at the same time in all four countries, namely, at the end of the twentieth century, yet it followed different tracks. In Austria and Finland, the incentive to establish an inclusive education system within the state education system rose from a consistent societal evolution towards democratic relations. The transformation of the education systems was based on the model of inclusion for all and developed in the following way: in Finland—to include all the students, and in Austria—with particular focus on the educational inclusion of national and immigrant minorities. Whereas in Poland and Lithuania, the beginning of inclusion in the education systems coincides with the countries' political breakthrough, liberation from the Soviet regime, and a highly segregated system of special needs education. Inclusive education system was based on the

model of individual inclusion, aiming to ensure the right for students with disabilities to learn under the conditions of inclusion (Galkienė, 2017).

The research presented in the study is based on the conceptual model of inclusion for all, as it is developed in the countries' education systems, applying the principles of the Universal Design for Learning (UDLP). The researchers follow the insight by Waitoller and Thorius (2016) stating that the interaction between the principles of pedagogy and the Universal Design for Learning (UDL) might prompt cultural pluralism, expand the perception of an expert learner as a reflecting and critically thinking student, encourage teachers' ability to recognise components that stigmatise students and promote exclusion, and build a barrier-free environment for the variety of students who come to their classrooms. For university teachers engaged in teacher training, the interaction might create conditions to continuously improve their inclusive education and UDL skills. Together, these components would lead to enhanced sustainability of inclusive education.

1.2 Universal Design for Learning as a New Phenomenon in European Education

Three decades ago, in 1990, Meyer et al. (2014), the developers of the UDL approach, concluded that in the traditional system of education, students encounter obstacles, which limit their accessibility to curriculum and the possibility of expressing the possessed knowledge. It is even worse, when curious and willing to learn, students suddenly realise they are being stigmatised not because of something they can control but because of the educational environment, which becomes a barrier to their successful learning.

The research conducted by Zhong (2012) confirms that traditional ways of education, applied in a traditional school, build learning barriers to a large number of students and not only to those with SEN but also to the ones without them. Only a small proportion of learners stated that a lecture (24%) and reading text (16%) are methods favourable for their learning.

David H. Rose, Anne Meyer—the developers of the UDL approach, as well as their colleagues, model a system of education transferring the principles of flexible and open to everybody environment in architecture (Connell et al., 1997) to the educational environment, emphasising the principle of eliminating barriers to successful learning for all students. Following Vygotsky's (1962, 1978) theory of the zone of proximal development and his sociocultural theory as well as research in neuroscience and education, they also develop the principles of learning to learn, which predetermine not only the conscious perception of knowledge and ability to apply it but also the understanding of one's own learning experience in the process, when students become expert learners (Meyer et al., 2014).

Pursuing the implementation of quality inclusive education, the theory of the bioecological model developed by Bronfenbrenner and Ceci (1994) supports the

ideas of UDL. This theory also emphasises the impact of proximal processes and the environment on human development and on its relationship with the environment: its perception, adoption, and creation. Following the bioecological model and the results of the research organised by the European Agency for Special Needs and Inclusive Education, the Ecosystem of Inclusive Education has been defined and it embraces four levels: (1) individual learner; (2) school; (3) community; (4) national or regional levels. It has been proven that the quality of inclusive education at the first, that is, individual, level is significantly related to the expression of inclusive ideas at all the other levels of the ecosystem (European Agency for Special Needs and Inclusive Education, 2019).

Meyer et al. (2014, p. 3) define UDL as an 'educational approach' that embraces areas related to the functioning of biological education process, curriculum, methods, and educational aids. 'Universal Design for Learning is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn'.[1] This educational approach offers specific guidelines to the educational community about the implementation of inclusive education, putting into effect the principles provided for in the Salamanca Statement: to acknowledge that every child has a right to learn and achieve results at a level accessible to them; every child is unique; every school must be prepared to respond to a broad and unique variety of children; general education schools must be accessible to children with special needs; and the most efficient schools are those that implement inclusive education (UNESCO, 1994).

1.3   The Formation of the Conception of Students' Uniqueness in the UDL Context

In the conception of UDL, the diversity of learners is seen as a natural phenomenon in society because no two learners exist who think in the same way or are distinguished by the same learning style, abilities, and interests (Rapp, 2014). The opinion that differences in learners are predetermined by health condition, social, and cultural peculiarities is significantly elaborated on in this approach. Meyer et al. (2014) state that the research conducted by neuro-researchers shows that the brain structure of students attributed to homogenous groups of leaners still has numerous individual differences, which predetermine different learning operations. However, these differences are not chaotic, and certain regularities are characteristic of them; thus, their manifestation in learning can be predicted as well. It is interesting that considerable individual differences, for example, predetermined by autism syndrome, do not always result in learning problems and, in some cases, they can precondition exceptional abilities.

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[1]The definition is available in the CAST website: http://www.cast.org/our-work/about-udl.html#.XygW0ij7RPY

Al-Azawei et al. (2016) highlighted the controversially evaluated perspective of learning styles, which is still applied in schools. Although the evidence about the links of learning styles with cognitive activities of learners is insufficient, the idea that learners can recognise ways of learning or their combinations that are convenient to them encourages the establishment of conditions for a meaningful learning experience.

Due to intensive migration processes, cultural, racial, and linguistic differences have lately become more and more visible (Fontenelle-Tereshchuk, 2020). Migrating for various reasons, people introduce changes to homogeneous school communities and encourage finding ways for quality education and the possibilities of achieving the highest personal results for all (Skourtou et al., 2020). A group of local national minorities acquires significance in the diversity of learners, which, next to the need to introduce varied ways of learning, also raises issues of self-identification (Curcic et al., 2014; Magazzini, 2020; Keskitalo & Olsen, 2019).

The diversity of learners, according to Arce-Trigatti and Anderson (2018), is a contribution to the development of democracy as it can not only facilitate the dialogue and collaboration of cultures but also accelerate the becoming of social justice, providing not 'some' but all the learners with equal opportunities to learn, to realise their own potential through education, and to create a more inclusive and just future. Therefore, Florian (2019) claims that the problem of focusing on 'some' learners can be solved by seeing the uniqueness of every individual as a basis for diversity of people and evolution of humankind.

1.4   Conceptualisation of Education Differentiation in the UDL Conception

Pursuing quality education within the diversity of learners, education differentiation has become one of the most significant criteria for the accessibility of education. However, differentiation is one of the most dangerous components of education for the creation of internal segregation and the stigmatisation of some learners. Florian and Black-Hawkins (2011) and Florian (2019) state that when, due to certain reasons, an educational action is exclusively directed towards some learners, a fact of exclusion is created.

'Differentiated instruction' is the most frequently applied differentiation approach Griful-Freixenet et al. (2020). Tomlinson (2000) claims that the educational needs of an individual learner or a small group of learners comprise the object of differentiated instruction. The construct of this approach consists of four components:

1. Content—what the student needs to learn or how the student will get access to the information
2. Process—activities in which the student engages to make sense of or master the content

3. Products—culminating projects that ask the student to rehearse, apply, and extend what he or she has learned in a unit
4. Learning environment—the way the classroom works and feels (Tomlinson, 2000, p. 2)

Efficient education through the application of a differentiated instruction approach is achieved when the teacher gives continuous consideration to whom they teach, where, what, and how they teach it (Tomlinson & McTighe 2006). The teacher, being well aware of the learners whose education has to be differentiated, plans the curriculum and educational methods that are most favourable to the student. But the fact that the teacher's differentiating action is targeted either at a learner individually or at a small group of learners calls for particular attention to be paid to the education organisation when implementing the programme. In cases where education is grounded on a traditional education strategy, a teacher has to allocate individual time to learners taught through differentiated instruction. Research shows that the implementation of education that is oriented towards separate learners causes difficulties for teachers in terms of attention distribution, time planning, and the development of learners' social relations (Kaffemanienė, 2005; Mills et al., 2014; Aas, 2019; Westbroek et al., 2020).

For this reason, instead of focusing on individual support to SEN learners, curriculum and means for its implementation are planned, which allows embracing the diversity of needs and inclinations of the whole group of learners and establishing conditions that result in minimising learning barriers to all learners (Meyer et al., 2014; Sanger, 2020). In other words, there is a transition from being aware of the individual differences of some students to acknowledging the diversity of all the learners, from meeting individual needs to creating a barrier-free educational environment that answers the individual needs of all learners.

Rapp (2014) and Griful-Freixenet et al. (2020) affirm that differentiation based on the UDL principle does not deny the possibility of applying differentiated instruction in cases where the individual needs of learners require it. However, according to Griful-Freixenet et al. (2020), although the problem of balancing differentiated instruction and the application of a barrier-free educational environment still requires a more comprehensive and empirical evidence-based answer, it is completely clear that striving for successful learning of every schoolchild and creating a barrier-free learning environment that is favourable to participation of all the learners, abilities of education differentiation become an essential component of teacher's competence. These abilities are essential criteria for a learner's success and a teacher's professionalism (Swanson et al., 2020). Following Van Boxtel and Sugita (2019) and Galkienė (2018), a teacher-professional applies learner-empowering principles of differentiation in all stages of education, starting with planning, organisation of education and evaluation of learners' progress.

1.5 Transformation of Educational Goals in the Contexts of Traditional Education and UDL

The choice of the education differentiation approach depends on the strategy of education a teacher acknowledges and applies. Teachers who prioritise traditional education, based on the essential goal to provide academic knowledge through a teacher-centred educational approach, according to Aas (2019), tend to focus on individual needs and difficulties. Such teachers link the education of the learners who face difficulties with the application of targeted intervention and correction, which should help the learner to overcome difficulties, even though such difficulties are produced by the same teacher organising education in a traditional way. According to these teachers, the planning of individual education takes too much time, and the implementation of this plan is impossible during regular lessons. Therefore, it is decided in advance that certain lessons are of no use to some learners. This results from the fact that in the system of traditional education, educational goals and ways of their implementation are oriented towards an average learner (Hitchcock et al., 2002).

Meanwhile, Aas (2019) suggests that the teachers distinguished by the context-based understanding of learners' needs tend to carry out general adaptations while planning a lesson and introduce them not as individual interventions but as an integral part of their lesson plan. According to Swanson et al. (2020), the teachers who base their activity on a student-centred approach strive for quality education for all and everybody (the exceptionally gifted and those with SEN) through the efficiency of suggested methods, education differentiation, cultural relevance, social-emotional learning and relevant content. Teachers applying the UDL strategy are the ones who empower their learners. Rapp (2014) states that by being aware of how and why their students learn, the teacher plans the curriculum in a way that ensures active and equal participation of all the learners in the process of education, versus the experience, when general educational goals are adapted to some learners and implemented at a separate time. According to Meyer et al. (2014), the essential goal in the UDL strategy is not a fact that has to be memorised by a learner, but the process of pursuing the goal in the most appropriate way for them. According to the authors, the flexible use of education methods and aids to attain the set educational goals minimises educational barriers and opens the door for full participation of not only SEN students but also improves learning opportunities for all learners.

1.6 The Construct of UDL Approach Implementation

Rose and Strangman (2007) state that the construct of guidelines for the implementation of UDL is based on three anatomically and physiologically different neuro-cognitive systems that are present in every cognitive act. An educational response

while prioritising the interaction of recognition, strategic, and emotional networks, and organising education within the UDL approach is determined through the three main UDL principles:

- Provide multiple means of engagement (the 'why' of learning)
- Provide multiple means of representation (the 'what' of learning)
- Provide multiple means of action and expression (the 'how' of learning) (Meyer et al., 2014, p. 51)

These principles serve as a basis for the specific guidelines for UDL implementation formulated by CAST (2018). They consist of three areas that aim at the implementation of every principle. Three checkpoints are suggested in every area that recommend educational variations for the implementation of every principle. Following these guidelines and considering the learners' diversity, teachers design flexible curricula, methods, aids, and environments, encouraging learners to attain challenging goals (Hitchcock et al., 2002; Rose & Strangman, 2007; Dalton, 2017).

CAST (2018)

Recognition Networks *receive signals coming through sensory organs, and their interpretation enables the recognition of objects and their models (letters, mathematical expressions, historical facts, figures, etc.). Recognition of models embraces all the areas of academic curriculum. Neurological and experiential differences in human cognitive activities predetermine differences in learning activity. Neurological differences are related to individual variations in the structure and function of recognition networks and result in differences in the management of cognitive activities. Experiential differences,* i.e. *accumulated experience and information stored in memory, allow recognising previously known models anew and reconstructing them. Neurological or physiological problems of recognition networks may lead to a whole range of learning disorders,* e.g.*, dyslexia, dysgraphia,* etc. *Re-cognition is the main but not the only component of such cognition* (Rose & Strangman, 2007).

Provide Multiple
Means of
Representation

The educational response to neurological differences in human cognitive activity would be providing multiple means of representation. According to Meier and Rossi (2020), learners' informing starts with the formulation of a clear goal. The UDL principle requires the goal to be flexible and achievable by applying various strategies of problem solving and ways of learning. However, Meyer et al. (2014) argue that ways of information perception and learning differ among learners to a big

extent. These differences are preconditioned by previously acquired basic information, the ability to reproduce this information, to find and use models important for its understanding and to employ ways for perceiving new information. To meet the diversity, a range of ways to present information are employed, using IT and other technologies that help to supplement information with text, language, animation, and image, and using various means of information emphasis and marking. In some cases, it is useful to present the same information with the help of several media, for example, sound and image.

The results of the research by Finnegan and Dieker (2019) evidence the significance of methods applied by the teacher to the perception of information, for example, empowerment of learners to gather information from various sources, to interpret it, to make concept maps, and to verbalise them. Active engagement of learners in the analysis of information leads to a deep and rich understanding and perception of it.

CAST (2018)

Strategic Networks comprise a set of neuronic networks, which physically and cognitively react to the recognised information models and control an act of complex response to the surrounding world. These networks enable people to plan, coordinate, and independently observe and implement physical movements and cognitive actions. They are related to executive functions of the highest level, which are involved while establishing the goals of activity, developing a strategy for their implementation, observing their implementation and progress or making decisions related to revision of goals, if necessary.

Differences in strategic networks while learning may result in variations in activity implementation at different levels, that is, from ordinary text writing to planning, organisation, creation of alternative ways, and search for support (Rose & Strangman, 2007).

Provide multiple means of action and expression

The educational response to neurological differences in human cognitive activity would be providing multiple means of action and expression. Boothe et al. (2018) and Sanger (2020) emphasised that an important stage in the process of successful learning is for learners to express what they have understood and learnt. Two forms of knowledge expression are usually applied: the conveyance of thoughts orally or in writing. However, taking into account variations in schoolchildren's learning

activities, it is necessary to provide them with the possibility of demonstrating their knowledge and activity results employing other ways as well: through physical expression, communication, artistic solutions, etc. In such cases, when a teacher creates conditions for learners to express themselves in ways favourable to them and chosen personally, it not only becomes possible for learners to efficiently adapt their own knowledge and to express it but also, according to Finnegan et al. (2019), to inform their teacher about how they learn.

CAST (2018)

Affective Networks *are responsible for decisions to manipulate models that are recognised and generated with the help of recognition and strategic networks. From a neurological perspective, affective networks regulate emotions and activate hormones that have an impact on a biological response, determine our primary emotional state, and form emotional reactions to the surrounding world. Learners' emotions and emotional regulation are very subjective and depend on biological and environmental factors. All of this predetermines differences in how individuals filtrate the world, make decisions, and learn. Following their emotions, motivation, and biological drives, learners establish priorities, maintain their activity if a challenge motivates them, or retreat if a challenge seems to be too difficult. Therefore, according to Vygotsky's (1962) recommendations, it is very important to consider the boundaries of every learners' zone of proximate development because a surmountable task assigned to a learner and accessible educational environment evokes motivation and contributes to achievement of good results. Meyer et al. (2014) claim that learners' involvement in the process of learning is an essential component of efficient learning* (Rose & Strangman, 2007).

Provide multiple
means of
engagement

The educational response to neurological differences in human cognitive activity would be providing multiple means of engagement. Schoolchildren's engagement in learning activities is strengthened not only by the compliance between topics and activities and their interests but also by other learning components. According to Hovey and Ferguson (2014), when applying the strategy of research-based learning, the majority of learners express a very positive attitude towards learning. They emphasise very active learning in various environments, collaboration with others and the possibility of sharing relevant ideas. The research by Ramdass and Zimmerman (2008) reveals that teaching children to search for various strategies for

problem solution and to evaluate their own self-efficacy, and to observe their own progress next to academic teaching, learners' self-regulation and their learning efficiency are strengthened. Ramdass and Zimmerman (2008, p. 37) state that 'classroom practice must not only cultivate the knowledge to succeed but should nurture the belief that one can succeed'. According to Farmer et al. (2018), favourable social relations built up in joint activities are necessary to ensure the learner's success at school. Gay (2013) claims that when the teacher applies culturally responsive teaching in an atmosphere where the diversity of learners is discussed as a value and the emphasis is placed on strengths rather than weaknesses, following the idea that success begets success, the self-confidence of learners with external differences related to their health, social, and cultural status or race is enhanced. This is significant because the research carried out by Farmer et al. (2018) shows that the personal narrative of learners is formed in social relations, which, according to Nieminen and Pesonen (2020), is of utmost importance to students' engagement in learning activities and coping with educational barriers.

1.7 The Concept of Successful Learning in UDL Approach

In the contemporary world, the conception of successful learning has acquired a much wider meaning that goes beyond the knowledge learnt. Meyer et al. (2014) emphasise that the learning of the provided content has not lost its meaning, but the emphasis is laid on another goal—to teach students to learn and to become expert learners. García-Campos et al. (2020) point out that the UDL strategy is favourable for encouraging learners to continuously make meaningful, in-depth and emotion-based decisions. After the teacher creates possibilities for constant reflections on their own learning, students' engagement in their own learning is promoted, which leads to the development of 'the motivation, the practice, the reflection, the self-efficacy, the self-regulation, the self-determination, the executive functioning, the comprehension, and the situational awareness' Meyer et al. (2014, p. 15).

Education organised within the UDL approach is grounded on the priority of learners' individuality. Therefore, it is natural that, for this reason, barriers may emerge in the educational environment that prevent certain learners from attaining their set goals. García-Campos et al. (2020) state that UDL is a system that focuses on the elimination of barriers to schoolchildren's learning and participation, suggesting direct and implied actions, which may be used in a varied way. For example, Meier and Rossi (2020) present the following classification of obstacles: (1) skill barriers; (2) curriculum barriers; (3) individual barriers. Planning a specific lesson, the teacher creates the matrices of possible barriers, considering the peculiarities of their learners. The first 'Teaching' matrix includes barriers of the first and second groups and is linked to potential obstacles due to previously acquired knowledge and developed skills, curriculum, or applied methods. The second 'Individual' matrix is related to the individual qualities of a learner. Scaffolds are

foreseen by the teacher to overcome the learning challenges without simplifying the established goals. In most cases, the successful application of scaffolds according to the first matrix leads to the natural reduction of obstacles assigned to the second matrix.

Al-Azawei et al. (2016) suggest that when education is planned for a diversity of students with UDL from the very beginning, barriers are reduced for schoolchildren with ordinary and special educational needs, and success opportunities are created for all learners.

The development of the skills of an expert in learning is a result of the successful implementation of the UDL principle (CAST, 2018). Consistent application of UDL principles and continuously encouraging reflection on teaching and learning practice together with learners allow the latter to be well aware of their learning process, to constantly improve it, and to engage in joint work of teachers and learners, as well as the evaluation of its results (García-Campos et al., 2020).

The results of scientific research on the assessment of education efficiency reveal that the application of the UDL approach builds learners' self-efficacy and their ability to represent themselves, cultivates their interest in new information and the level of its understanding, as well as their ability to generate, model, and present information in various ways (Capp, 2017). Such learners are characterised by an increased satisfaction, positive attitude and engagement in the learning process (Al-Azawei et al., 2016). When acting together in the learning process, high results are achieved by all students, including learners with special educational needs and exceptionally gifted ones (Katz, 2013).

1.8   Generalisation: Universal Design for Learning in the Context of Traditional Education

While pursuing the quality of inclusive education implementation, science, and educational practice are still exposed to problems of interpreting the diversity of learners, balancing the interaction between special and general education, and implementing the philosophy, principles, and practice of inclusive education at school. These issues remain open to the agenda of science and educational practice.

In traditional education system, when fulfilling the needs arising in the diversity of students, the components of individual inclusion prevail. In this case, the focus falls on the students with the most distinct differences in learning abilities, and assistance for them to reach the knowledge and skills outlined in the curricula. The implementation of individual inclusion in the context of traditional education follows the following approach:

– Learners with disabilities, other special educational needs, or exceptional gifts are distinguished by differences in learning activities.
– The reasons for learning difficulties lie in the nature of a learner and in his/her social or cultural experience.

- Learners' needs comprise the object of education differentiation.
- The goal of education is learning established facts and acquisition of abilities.
- Education is actualised by established learning standards, the results of tests or examinations.
- Teacher-centred education. The teacher sets general and individually adapted educational goals, chooses appropriate methods, and suggests educational aids.
- The teacher and specialists provide necessary help to a specific learner.

Whereas in the case of universal design for learning, the concept of inclusion for all is followed, which is based on the belief that opens possibilities for individual, success-oriented self-expression of all students in the joint process of learning:

- Differences in learning activities are preconditioned by biological, social, and cultural factors and are typical of all the learners. Students with disabilities or exceptionally gifted ones are characterised by more vivid and specific differences, but they make up a part of the same group of learners.
- The reasons for learning difficulties lie in the educational environment, which creates barriers to access necessary knowledge, to recognise objects and their models, to manipulate, construct and design them as well as demonstrate the obtained results.
- The educational environment is the object of education differentiation: educational methods, sources of knowledge, aids—their flexible interaction that ensures barrier-free education for all and leads to the same goal.
- The goal of education is the process of student's learning: fact-finding, critical reflection on them, finding solutions to an assignment or problem, etc.
- Learning when interested and engaged in the process is an essential component of efficient learning. Actualisation of education in the learner's experience is one of the components of pedagogical act.
- The outcome of UDL is to educate and develop a student as an expert in learning. Organisation of child-centred education is directed to encouraging a student to be an active participant in education organisation: contextualisation of learning goals based on own experience and interests, choices of ways of activity and aids, reflection on activity and results.
- Culture of collaboration is implemented through the preparation of the environment that is favourable for collaboration, introducing scaffolds to overcome possible barriers. The teacher is a partner in learner collaboration.

The efficiency of implementing this education approach while developing inclusive education for success of all learners is evidenced by the results of numerous studies (Rao et al., 2020; Katz, 2013; Capp, 2017; Al-Azawei et al., 2016). This education approach, as a scientifically substantiated system of guidelines for educational practice, is included into the federal educational policy in the USA and is suggested to be used as a basis in teacher training and qualification development programmes (Smith et al., 2019). The use of the UDL approach is widespread in the USA. More frequently used concepts in Europe (known as 'Inclusive Design' in the United Kingdom and 'Design for All' in the majority of European countries) define

the accessibility of the environment and information to all and change thinking about inclusive education as well as the means for its implementation (Clarkson & Coleman, 2015).

In this action research, the concept of the UDL is understood as an educational approach to the implementation of quality inclusive education. The discussions in the international group of researchers, including pedagogues and researchers engaged in teacher training from four European countries, and Center for Applied Special Technology (CAST) specialists who developed the UDL framework and guidelines, made it clear that when introducing a new approach for inclusive education development at school, the social, cultural, and educational context of the country becomes relevant. Thus, the school in Vienna is already applying individual elements of the UDL in its education system; therefore, to further develop the inclusive education system, it is reasonable to reconceptualise the existing one. In Finland, the model of teachers' inclusive competency development is systematically reviewed. This action research adds elements of UDL approach to the currently developed Finnish teacher competency model, thus expanding and specifying the direction for shaping teachers' beliefs and practices significant to inclusive education. In Poland and Lithuania, inclusive education systems are still affected by the traditional construct of individual inclusion. This causes serious barriers to the development of inclusion for all in the countries. Therefore, the group of Polish researchers resolved to purposefully introduce and analyse the UDL approach in the school education system by applying all three UDL principles. In the study, the research results are presented as three stages in the education process transformation when applying the UDL in the context of continuous change. In Lithuania, a student achievement analysis is continuously carried out, which shows insufficient in-depth learning and its results among students. This action research analyses how expert learner skills are developed by implementing inclusive education through the UDL approach. It focuses on three goals set out in the UDL approach: to educate an expert learner who is resourceful and knowledgeable, strategic, and goal-directed, and purposeful and motivated. Different parts of the action research aimed at revealing different groups of expert learner skills are presented in the study. Overall, the study provides a diversified picture of applying the UDL approach for improving inclusive education, which is valuable in both scientific and practical terms.

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Chapter 2
The Goal of the Universal Design for Learning: Development of All to Expert Learners

Julita Navaitienė (ORCID) **and Eglė Stasiūnaitienė** (ORCID)

Abstract Over the past 10 years, every learner's ability to achieve the highest level of learning success has become quite an important topic. The Universal Design for Learning (UDL) sets a goal to allow all learners to achieve their optimal learning experience that matches inclusive education. Learners who can assess their own learning needs set their personal learning goals, and monitor their progress are termed the expert learners (McDowell. Developing expert learners: a roadmap for growing confident and competent students. Corwin, 2019). This chapter focuses on theoretical backgrounds for expert learners' paradigm. It starts from fundamental constructivist theories and moves towards the theory of self-regulation and cognitive neuroscience approach. It concentrates on the theory of self-determination, which, in our opinion, validates in the best way the nature of the expert learners' development. Implementation of the Universal Design for Learning allows all learners to access, participate in, and progress in the general-education curriculum. This chapter presents the specific profile of the expert learners covering their main characteristics and qualities and revealing the essence of the UDL framework. Educators could use the profile as the educational guidelines conductive to understand how the process of becoming the expert learner proceeds.

2.1 Why Expert Learners?

Classrooms are remarkably diverse now globally, and that fact enriches today's school as well. Each learner is unique and needs various individually appropriate learning methods according to their abilities, intelligence, and learning styles. Every

J. Navaitienė (✉) · E. Stasiūnaitienė
Educational Academy, Vytautas Magnus University, Kaunas, Lithuania
e-mail: julita.navaitiene@vdu.lt; egle.stasiunaitiene@vdu.lt

learner can achieve their own highest level of learning potential. Setting realistic, achievable, but challenging goals, actively engaging with the learning material, taking responsibility for learning, and controlling the learning process, the learners commit to growing. The concept of the expert learner is most closely associated with learning success and the development of a growth mindset. It is defined in different ways by various researchers and practitioners, but the desire to learn and to know how to learn best dominates most definitions. Schwartz and Manning (2018a, b) argue that expert learners are notable for their planning, resourcefulness, diligence, and confidence. They control their learning, and therefore they study differently.

However, most of the students are learning according to the general education curriculum (Darling-Hammond et al., 2020). Understanding the curriculum as a sequence of learning opportunities provided to students clarifies that the learning environment should be designed so that everyone can grow knowing and using his or her strengths. In this way, people could perceive students with different learner profiles as unique learners with equitable developmental opportunities (Bali & Caines, 2018).

The Education 2030 (UNESCO, 2015) proposed a new vision for education to ensure inclusive and equitable quality education for all. UNESCO's head of Education, Stefania Giannini (2021), shares imperatives for an education recovery package due to the COVID-19 pandemic, and the first imperative is to reopen schools safely and inclusively. Inclusive education is the core of transforming educational systems, enhancing learning opportunities for all learners, supporting the personalization of education, and changing the traditional one-size-fits-all approach to learning. Opertti et al. (2014) delineate an inclusive curriculum as developing shared goals, strategies, and practices and responding to the uniqueness of each learner. The Council of the European Union's recommendation on shared values and inclusive education and the European dimension of teaching (2018) calls for ensuring equal adequate access to quality inclusive education for all learners (e.g. migrants, disabled, talented, or poor) (European Commission 2018). The European Agency for Special Needs and Inclusive Education (2019) stresses the changing role of specialists in providing inclusive education by supporting the rights of all learners.

The Global Education Monitoring report "Inclusion in education: All means All" (2020) proposes the universal design for learners as an effective strategy for the inclusion of all learners.

Inclusive education environments are barrier-free: applying the universal design for learning strategy helps to remove physical, sensory, and cognitive barriers to learning and ensure accessibility of inclusive education for all learners. There is an increased focused attention to academic achievement as the most crucial goal of education in many countries. Inclusive education aims to provide all students with the most appropriate learning environments to achieve their best potential (Hornby, 2015).

There is a framework that provides all the students with equal opportunities to learn. Universal Design for Learning (UDL) describes a practice and science-based framework to support education, give challenges, and expand opportunities

for all learners. It is a way to involve every student in the learning experience, promote fully inclusive learning, and facilitate success for all learners with different abilities.

The use of the UDL enabled the teachers to teach all learners and reduce the learning barriers that arise during the general education curriculum uptake (Rao et al., 2016). Creating the path of successful inclusion for students with different needs, the UDL helps provide an engaging, accessible, and expressive learning environment (Evmenova, 2018). Rose et al. (2018) emphasize that the UDL focuses on weaknesses and barriers in designing the learning context itself, not on the learners. One of the primary goals of the UDL framework is to improve and optimize learning for all students. Griful-Freixenet et al. (2020) explored the inter-relationship between UDL and differentiated instruction as two pedagogical models and found that both declare the variability in any group of students. Therefore, the teachers should adjust their teaching according to diversity in the field of inclusive education. Cook and Rao (2018) highlighted how secondary teachers could adapt effective practices of UDL for learners with learning disabilities. According to Rose and Meyer (2002), UDL guides students to be the best learners they could be. The recommended process should help students to become more expert learners. It should not take the form of filling students with the knowledge, but of students taking care of their learning.

The concept of expert learners is closely associated with the universal design for learning. Students can become expert learners as they develop and make themselves more knowledgeable, skilful, and motivated (Meyer & Rose, 2000; Meyer et al., 2014). The students who want to learn and know how to learn are successful learners in most cases. UDL implementation aims to develop the learners who know their own learning needs and can meet them by regulating their behavior, thinking, and emotions. Rose and Meyer (2002) emphasized that UDL could provide equal access to education and guide students to be the best learners they can be.

Active educational inclusion involves the recognition that we can support all learners according to their differences. UDL principles for learning help create a supportive environment within which the educational goals will be student-centred and directed to the mastery of learning. Black et al. (2015) note that UDL aims to be inclusive for all learners and helps to reduce barriers, especially for those with disabilities. Dalton et al. (2019) provided examples of applying the UDL principles for learning from South African and US institutions of higher learning. They approved the use of UDL to strengthen the successful inclusion of learners with differing needs. The UDL model of inclusion treats disability as only one of many dimensions of learners' differences. Bray and McClaskey (2016) explain how personalizing learning presents the UDL framework as a very flexible approach to individual differences and needs of all learners. These authors described the expert learners as independent, self-directed, and self-motivated. Quirke and McCarthy (2020) recognize that UDL ensures the inclusive learning environment of the greatest extent and adapts the best pedagogical approaches.

Applying the UDL framework in the classroom would not be efficient enough if there is no challenge for students to become purposeful, motivated, resourceful,

knowledgeable, strategic, and goal-directed; in other words, if we do not nurture expert students in the classroom.

2.2   Theoretical Basis for Expert Learners' Development

Inclusive education focuses not only on "access" to learning but also on the "participation" and "progress" of learners (Ainscow, 2020; Ramberg & Watkins, 2020). To understand the implementation possibilities of inclusive education through the UDL framework, we should analyze the theories and approaches that could support expert learners' development using the classical and the newest ones.

Constructivist Learning Theories uphold the proposition that learning results from mental construction when new information fits together with what is already known. UDL proposes that students become active learners and extend their understanding by connecting further and current information. The construction of knowledge requires learners' activities; therefore, it is a continually dynamic process in which students transform their cognitive structures. The task of the teacher is to engage the learners to be active participants in their learning process. Findings from the neurosciences that reveal a vibrant and flexible interaction between the environment and the learning brain strengthen constructivist learning theories and the UDL framework. The principles of UDL refer to the recognition, strategic, and affective neural networks to reflect the specializations in the learning process. Knowledge and skills are traditionally the mainstays of learning. Expert learners can discover new and open-ended connections of novel information. Expert learners see learning as purposeful and meaningful when they can operate with knowledge received. Since expert learners actively create their knowledge, it is customary for them to ask questions and explore.

Piaget's cognitive theory (Piaget, 1973) is one of the most influential constructivist theories in education. It relates to how knowledge is constructed and constantly reconstructed through personal experience. This theory declared cognitive development as a process guided by biological maturation and interaction with the environment. Therefore, knowledge (as the cognitive structures) varies from learner to learner because of their personal experiences and level of development. Although scientists have questioned Piaget's cognitive theory, it could be useful for the teachers to understand how to facilitate the active creation of knowledge by expert learners. Different ways of understanding the world characterize the learners.

Bruner's constructivist theory (Bruner, 1977) presents learners as comparing new ideas to old ones and searching for similarities and differences. In turn, the teacher should translate learning information according to the learners' state of understanding. Representation and categorization are keys to learning. The learners choose and transform data and make decisions based on their cognitive structures. This theory views the role of teachers in student learning as very important because they can teach some aspects of any learning content to any learner. The theory

reveals three modes of representation used in the learning process: enactive, iconic, and symbolic. To demonstrate knowledge through appropriate motor activity, use enactive representation. Iconic representation includes the use of images, signifiers, and structures to express understanding. Symbolic representation—the most common mode—comprises the use of language and symbols. The teachers can learn from this theory about the importance and ways of representation when teaching expert learners. The theory also exposes the heuristic nature of learning. In this theory, mastery of fundamental ideas is related to understanding general principles and solving problems.

Vygotsky's social constructivist theory (Vygotsky, 1978) reveals that learners ought to be engaged in the learning process to construct knowledge and learn from one another. Learning of cooperative learning groups is based on the benefits of social interaction. Relying on group work and peer–peer interaction, the construction of knowledge becomes more efficient. The theory submits social interaction as the practical framework for learning. Recognition of the relationship between the learning process and social activities led to the suggestion that learning occurs with the teacher's support and classmates. The learners do not hesitate to seek help from the teacher or other learners when they need it. There are three essential principles of learning according to the theory. The first principle emphasizes the critical role of social interaction in learning. The second one is associated with the potential of the learner's cognitive development. This theory accentuates that each learner has an individual extent of learning potential and describes it as the zone of proximal development. The third principle points to the importance of a supportive and conducive learning environment. Vygotsky's theory analyzes the role of culture in developing higher mental functions such as attention, memory, thinking, and language. Learning is the internalization of social processes and the translation of social functions into higher cognitive functions. With this, the teachers provide direct learning experiences to the learners. The theory may be helpful for teachers who want to understand their role in the learning of expert learners clearly and seeks to facilitate their learning.

Social Cognitive Learning Theory (Bandura, 1991) espouses reciprocal determinism and describes it as the interaction between behavior, personality, and the environment. One of the essential concepts in this theory is anticipation that orients people's actions, motivates them, and helps people choose their direction of activity. The approach emphasizes the importance and significance of self-regulation through self-reflection and self-evaluation. The term self-efficacy is unique to this theory and refers to the learners' confidence in their ability to learn successfully. Self-efficacy is the foundation of learners' potency to learn. Learners believing in learning success strive to reach their learning goals, perform effectively, and persist in the face of difficulties.

It should be noted that some learning barriers can limit learners' self-efficacy, which is an important message for inclusive education practitioners. It is worth noting that the core component of learning is self-regulation, and the daily learning activities of expert learners include this component in most cases. It usually

means reflecting on one's understanding. The students are motivated to actively participate in the accommodation and assimilation of new information through relevant activities and then reflect on their experiences. Bandura (1991) proved that students could control their behavior and referred to it as a process of self-regulation. Self-regulation is associated with identifying a set of goals and with the endeavours to attain the goals. Therefore, the teacher who wants to educate a goal-oriented expert learner should be interested in the recommendations of this theory.

Constructivist learning theories reaffirm that students' learning becomes more successful when they actively construct knowledge and understanding using their own experiences. By applying different learning strategies, students in the constructivist classrooms have the real opportunity to become expert learners.

Cognitive Neuroscience Approach

Discoveries of cognitive neuroscience about learning brain: neuroplasticity and variability (Fandakova & Hartley, 2020), curiosity (Gruber et al., 2019), memory (Quent et al., 2021), goal-directed behavior (Huang et al., 2020), importance of prior knowledge (Alonso et al., 2020) help teachers to design learning environments that take advantage of these brain characteristics.

Contemporary neuroscience research suggests learning results from different large-scale network activity in the brain (Cantor et al., 2018; Quent et al., 2021; Mattar & Bassett 2020). These networks cooperate in the learner's brain for completing specific cognitive functions (Siew et al., 2019). Cognitive neuroscience offers a theoretical framework for understanding brain functioning as a system covered by neurons' structural and functional networks (Petersen & Sporns, 2015). Hartwigsen (2018) emphasizes a new perspective on the compensatory flexibility of these brain networks.

The cognitive neuroscience approach to learning brain includes the standard action of three sets of neural networks: (1) recognition network that helps the learner to recognize the patterns, collect information, and put it into meaningful categories, (2) strategic network that assists a learner to plan and generate the patterns and perform tasks, and (3) effective network that determines which patterns are most important for a learner and manage motivation and engagement (Rose & Strangman, 2007). Cognitive neuroscience studies of the brain have confirmed that these three main networks are active during learning (Siew, 2020; Wardle & Baker, 2020; Allegra et al., 2020; Markett et al., 2018).

The use of these networks in inclusive teaching and learning is applicable and makes the development of expert learners more effective through meeting learners' needs and considering individual learners' differences. Expert learners are managing specific networks of knowledge in their brains: "knowing what", "knowing how", and "knowing why". Therefore, expert learners are prepared for learning, know how to learn, and want to learn. An expansion of the "knowing what" network contributes to the development of resourceful and knowledgeable learners, a strengthening of the "knowing how" network develops strategic and goal-directed learners, and activation of the "knowing why" network develops purposeful and motivated learners.

Siew (2020) points to the fundamental goal of education as structural and functional changes within the knowledge networks of learners. The learners assimilate the meaningful knowledge when they progress from being the novices to the experts. Expertise is associated with developing complex and hierarchical cognitive structures in the brain (Bilalić & Campitelli, 2018).

Persky and Robinson (2017) present several characteristics of experts. For example, they argue that experts know more, and their knowledge is better organized and integrated into the existing knowledge system. They also have effective strategies for using knowledge, have strong motivations, and are sufficiently self-regulated because their knowledge is well-organized. Consequently, making inferences, concluding, and finding solutions do not seem impossible to them.

Transforming learners into expert learners is doable if the three brain networks (recognition, strategic, and affective) are targeted by the UDL framework.

Self-Regulated Learning Theory is one of the new but widely accepted learning theories within education. It emphasizes the students' achievements in learning by metacognition, self-control, motivation to learn, autonomy, planning, monitoring, and evaluating (Zimmerman, 1990, 2000, 2002, 2015; Perry & Rahim, 2011; Panadero, 2017; Zeidner, 2019). Self-regulated learning is defined as a self-directed learning goal process through monitoring, controlling, and reflecting on one's learning (Zimmerman & Schunk, 2008; Zimmerman, 2015). Walker and Russell (2019) considered self-regulation as one of the executive functioning skills.

According to Panadero (2017), self-regulated learning involves six models and many different factors that motivate learning. The Metacognitive and Affective Model of Self-Regulated Learning or MASRL (Efklides, 2011, 2019) presents self-regulated learning as a complex and dynamic process that includes the learning task, abilities, knowledge and skills, motivation, feelings, and judgments. Despite being young, a significant number of scientific articles have already analyzed this model. Pintrich (2000) delineates self-regulated learning as an active process and presents the model of self-regulated learning. This model includes four phases: forethought, planning, and activation; monitoring; control; and reaction and reflection. Each stage has four areas for self-regulation: cognition, motivation, behavior, and context. Goal orientations are the fundamental construct in this model and are why learners perform the learning tasks.

It is important to note that educators could teach their students to become self-regulated learners (Schunk & Zimmerman, 1997, 1998). Zimmerman (1986, 2000) has developed three self-regulated learners' development models: the Triadic Analysis model, Three Phase Cyclic model, and Multi-Level model. The fourth and latest model, called the Social-Cognitive Multi-Level model of Self-Regulation Development, consists of the four stages in which learners acquire self-regulatory competency (Zimmerman & Kitsantas, 2005). These stages are observation, emulation, self-control, and self-regulation. In the observation stage, learners pay attention to the expert's (e.g. teacher's) example of activity. In the emulation stage, learners perform, keeping in mind the model seen, but seldom copy it precisely because of lack of skills. Teachers can facilitate emulation until

students achieve a suitable level of mastery. The self-control stage begins when learners can practice in the absence of the example. Practice should be reflective and structured, helping to reach some automaticity. The amount of learners' self-reinforcement could determine their success in this stage. In the self-regulation stage, learners perform in new or changing conditions, monitor and evaluate the results, and plan their future performance. Learners do not have to go through all four stages to develop self-regulation; however, being present at these stages is desirable.

Self-regulated learners could be described as active participants in their learning process—emotionally, motivationally, and cognitively (Zimmerman, 2001, 2002). They can take up and channel their learning activity to achieve the personal learning goals they set. They can set achievable, realistic learning goals, seek, acquire, organize, and transform information, control and direct their mental processes, and implement the most appropriate cognitive strategies and actions to achieve learning goals. Self-regulated learners are interested, self-motivated, organized, persistent, diligent, and analytical. They nourish high self-efficacy and positive emotions (e.g. enthusiasm) towards their learning goals, knowing how to create a suitable learning environment. They fearlessly seek support and help from their teachers and classmates when they need it and actively participate in regulating academic tasks, performance evaluation, and workgroup organization. Self-regulated learners can avoid or overcome external or internal distractions during the learning process.

Self-regulated learners become masters of their learning processes, transforming their intellectual abilities into task-related skills (Zimmerman, 2015). As the driver of the development of the expert learner, the teacher could provide the support and scaffolding when the learner's self-regulatory practices develop.

By generalizing and summarizing many approaches to self-regulated learning, we find that there are three significant phases of self-regulation learning: (1) planning one's learning (analysing the learning task, setting learning goals, and planning learning strategies); (2) monitoring progress of plan implementation (implementing the plan from phase one and monitoring the progress of implementation); (3) evaluating the outcome of the plan application (determining how well planned learning strategies worked). Reflection (including self-questioning, which facilitates the reflective process) goes on throughout all three phases.

Kitsantas et al. (2000) revealed the differences between experts and novices in their self-regulation. Experts know when and how to apply the knowledge they have learned, whereas beginners learn reactively without planning or reflection. It is essential that experts like and can set personal goals for themselves.

Steiner (2016) investigated the differences between lower and higher achieving learners and discovered that self-regulated learning strategies, such as managing study time, handling goals, and metacognitive reflection, increased learners' test grades and self-confidence.

Self-regulated learning unlocked a new perspective on developing expert learners who became successful because of control of the learning environment. The relationship between self-regulation and expert learning manifests itself in how the students master and manage their education.

The Self-Determination Theory of Deci and Ryan (1985, 2012) presented a self-determined motivation theory of intrinsic motivation. It later grew to self-determination theory and became one of the most widely applied, functionally focused, and empirically supported views.

Self-determination as a psychological construct indicates self-caused, volitional actions (Wehmeyer et al., 2017). The scientific literature has offered several definitions of self-determination. Still, after analysing for standard features, it turned out that self-determination is a combination of knowledge, skills, values, and attitudes that enable a person to perform goal-directed, self-regulated, and autonomous activity. Hui and Tsang (2012) reviewed self-determination as a psychological and positive youth development construct. They defined it as the competence of young people in engaging in voluntary behavior and their autonomy in making choices and decisions. Legault and Inzlicht (2013) examined how independence improves performance by enhancing neuro affective responsiveness and highlighted the importance of autonomous motivation.

Self-determination theory provides a framework for understanding the factors that promote the learner's learning motivation and efficient psychological functioning. It is a basis for learners' self-motivation and personal growth. SDT emphasizes the importance of the three most important, innate, and universal human needs: competence (one's need to have achievements, knowledge, skills, and mastery over different vital tasks), relatedness (one's need to belong and connect with others), and autonomy (one's need to feel that one is in control of his or her behavior) (Ryan & Deci, 2000, 2016, 2017).

SDT has much breadth and depth because it consists of six mini-theories (Ryan & Deci, 2019): (1) Cognitive evaluation theory, explaining effects of rewards, feedback, external events, and interpersonal and intrapersonal processes on intrinsic motivation; (2) organismic integration theory, clarifying internalization and differentiation of extrinsic motivation; (3) causality orientation theory, authorizing individual differences in motivational orientations; (4) basic physiological needs theory, telling about satisfaction and frustration of autonomy, competence, and relatedness concerning psychological wellness and full functioning; (5) goal contents theory, revealing aspirations, life goals, and their varied consequences; and (6) relationships motivation theory, expounding the self in close relationships.

Wehmeyer (1999) suggested understanding self-determination as an educational construct. He has proposed that one can develop self-determination through learning.

The application of self-determination theory to educational settings has proven productive (Reeve, 2002; Denney & Daviso, 2012; Raley et al., 2018; Hagiwara et al., 2020; Ryan & Deci, 2020). SDT could explain why some learners are engaged and motivated in their learning and why learners' autonomy facilitates their learning and develops their competencies. Many studies have identified a strong correlation between academic achievement and self-determination of learners with and without disabilities and focused teachers' attention on the self-determination skills teaching (Mithaug et al., 2003; Gaumer Erickson et al., 2015; Shogren et al., 2015; Shogren

& Ward, 2018; Manganelli et al., 2019; Raley et al., 2020). SDT appreciates the learners as mature enough to know what is worth doing, capable of acting in their interests, sufficiently knowing why they need to learn, and using what they learned. They do this because they are naturally curious and want to explore and understand. They can organize and manage their learning (Wehmeyer & Zhao, 2020).

Field and Hoffman (1994) developed a five-step model for self-determination, defining self-determination as the ability to identify and achieve goals based on a foundation of knowing and valuing oneself. The model has five major components: (1) self-knowledge; (2) self-evaluation; (3) planning; (4) acting; and (5) experiencing outcomes and learning. The first two components describe self-awareness, the following two components identify planning, and learning skills reasoned on self-awareness. The final element of self-determination includes evaluation of one's actions. This model was applied to the development of self-determination of learners and served as the basis for the steps to self-determination curriculum formation (Hoffman & Field, 2005). Self-determination developmental programs validated by this model have helped learners participate more actively in their education. They were able to reflect on what is important to them, set relevant goals and achieving those goals, and answering their basic psychological needs of autonomy, relatedness, and competence.

The concept of the three basic psychological needs provides a sound basis for predicting whether the learning environment will support optimal learning. Learners experience competence when they are challenged by the tasks and given constructive feedback from the teachers. Learners meet their need for relatedness when communicating and collaborating with teachers and classmates, who are listening and responding to them. Learners satisfy the need for autonomy when they feel supported by teachers and classmates to take the initiative and perform. Learners are engaged in their learning and motivated to learn when the educational environment is created and friendly to satisfy all three needs.

Wehmeyer (1999) established a functional model of self-determination with four fundamental components: (1) behavioral autonomy; (2) self-regulated behavior; (3) psychological empowerment; (4) self-realization. They reveal abilities (behavioral autonomy and self-regulation) and attitudes (psychological empowerment and self-realization) that must be developed if a person wants to be self-determined. The self-determined learning model of instruction was developed on components of this model (Wehmeyer et al., 2000). It was a model for teachers seeking to engage the learners in self-determined learning and enable them to self-regulate and self-direct during the learning process (Shogren et al., 2017). A model could be used as a pattern to create curriculums and to prepare instructional materials. It has three phases: (1) the first phase helps to determine what learners want to learn and what instructional goals to set; (2) the second phase helps to know what is needed to learn and possible barriers to learning; (3) the third phase contributes to actions for goal achievement and removal of barriers.

The development of self-determination training models continues to this day. Chambless et al. (2019) proposed the "achieving success by promoting readiness for education and employment" (ASPIRE) model for teaching self-determination to

youth with disabilities. This model defined 13 central elements of self-determination development: (1) choice-making; (2) decision-making; (3) problem-solving; (4) goal-setting and attainment; (5) independence with safety and risk-taking; (6) self-observation, self-evaluation, and self-reinforcement; (7) self-instruction; (8) self-advocacy and leadership; (9) positive efficacy and expectations; (10) self-knowledge and self-awareness; (11) understanding of one's disability and one's ability to talk about his or her disability; (12) disclosure of disability and ability to ask for accommodations; (13) receive and exploit effective assistive technology. Most of these components overlap with those provided by Wehmeyer et al. (2013) and Wehmeyer (2019) for the education of all learners.

Identifying the characteristics of self-determined learners (e.g. skills, abilities, attitudes, and beliefs) enables educators to develop self-determination in their students and clearly understand what qualities to develop.

According to Wehmeyer (1996) and Wehmeyer et al. (2007), self-determined learners have four essential characteristics:

1. Autonomous behavior according to their learning interests, needs, preferences, and abilities
2. Self-regulated behavior, including self-monitoring, self-instruction, self-evaluation, and self-reinforcement, learning goal setting and attainment, and problem-solving
3. Psychological self-empowerment through the internal locus of control (the belief that they have control over their learning), self-efficacy (the idea that they have sufficient skills to achieve desired learning goals), and positive expectations (the belief that satisfactory learning outcomes will be achieved when choosing to apply those skills)
4. Self-realization using self-knowledge (knowledge of their strengths and limitations) and self-understanding (ability to understand their actions, thoughts, and emotions)

Learners who possess these four functional characteristics are self-determined. Each element is necessary but not sufficient. The learning environment or, for example, the age of learners may impact the level of the essential characteristic. Autonomous learners can act relatively independently from the influences of the environment or more dependently on it. Bigby and Douglas (2020) suggested schematic representation of the framework, which conceptualized support for decision-making and spotlighted the needs of learners with cognitive disabilities to be supported sometimes. Self-regulating learners can cope with how their environment influences their plans and revise their plans according to the influences of their environment. Self-empowered learners can feel self-effective and exhibit internal locus of control or feel insufficiently competent and often perceive external control. Self-realizing learners can use comprehensive self-knowledge or focus on superficial self-knowledge because self-understanding forms through self-reflection.

Since self-determination enables the learners to engage in goal-directed, self-regulated, and autonomous learning, knowing and understanding these four essential characteristics can help teachers find the most effective strategies to develop them.

The four characteristics of a self-determined learner discussed above are associated with several qualities. Although there is no exhaustive taxonomy of these qualities, some of the markers are most common (Wehmeyer et al., 2007; du Toit-Brits & van Zyl, 2017; Raley et al., 2020; Shogren, 2020) and can be the guidelines for teachers developing self-determined learners. Below is a brief description of some of these qualities.

Choice-making skills are one of the qualities of self-determined learners who take the opportunities to express their wishes and preferences, making their own constructive choices. They can select an item or activity from a variety of options at a particular moment in learning. That way, they become relatively independent learners. They make choices about what kind of task to carry out, what activity to pursue, how to spend leisure time, and so on. Stating preferences and making choices, learners become more engaged and interested in learning. Self-determined learners can explain their priorities to teachers or classmates and choose without coercion. When learners express their choices based on their preferences, they can make independent decisions.

Decision-making skills make self-determined learners quickly and responsibly identify the situation, consider potential solutions or actions, set down the advantages and disadvantages of each option, and make the decision. They can combine logic and intuition to think the right way, consider teachers' and classmates' views, and know their priorities and values. They are open-minded, willing to change, and be flexible. Self-determined learners are realistic: they understand what can or cannot be done in such a situation. Decision-making and problem-solving are closely related because many decision-making skills are helpful to problem-solving.

Self-determined learners can identify the problem, revise multiple alternative possible solutions, identify possible consequences, select the most appropriate solution, implement this solution, and verify its effectiveness. If the issue remains unsolved, they try to resolve it by involving someone else in the problem-solving process, looking for help, applying another coping strategy, using critical thinking, and so on. They usually have positive expectations for problem-solving and persist against emotional stress. By solving problems, self-determined learners reduce or eliminate the discrepancies between what they expect and what they receive from learning in reality.

Goal setting and attainment skills enable learners to determine a goal, develop a plan to achieve that goal, and monitor the goal achievement process. Self-determined learners can define what they want or need to learn, refine their goals to be clear, break the goals into objectives, and list the options and possible consequences of the options. They can also choose the best option, act on it, monitor and evaluate their progress, and decide if they have met the goals. If not, they adjust or change it. If yes, they reinforce themselves. When setting learning goals, they are not afraid of taking risks, and when attaining the goals, they develop support networks. Setting and achieving goals regulate self-determined learners' efforts and persistence.

Self-management skills allow the learners to control their thoughts, feelings, and actions. Self-determined learners can explain the purpose of self-management. To

manage themselves, they monitor their behavior, attend to when and why they use such behavior, assess observed behavior, and continue or change it. They understand their strengths, seek opportunities to maximize their abilities, believe in themselves, plan their time, know what is most vital for them, and are accountable and feel responsible for their behavior.

Self-advocacy and leadership skills help self-determined learners to protect and make themselves more assertive. Without some degree of advocating for themselves, the learners would not attain their personal goals. Self-determined learners can be sufficiently assertive in gaining knowledge, defend their opinions and/or their rights, seek and maintain reinforcement, express an unpopular or different idea, persist in actions to achieve the desired goal, and employ negotiation and compromise. They view themselves as leaders, inspire classmates to learn and influence their opinions, resolve conflicts, facilitate teamwork and participation, critique ideas or proposals in a constructive manner, and so on. Self-determined learners can express opinions and speak up for themselves and their classmates.

High self-efficacy and positive outcome expectations make self-determined learners believe in performing at a designated level of performance. Self-determined learners are convinced that they will solve problems and accomplish goals if they invest the necessary efforts. They obtain essential outcomes, successfully overcome challenges, focus on progress, strive for excellence, not for perfection, are self-confident, not fearful of failure or mistakes because of viewing mistakes as opportunities for improvement. Those with high self-efficacy, in most cases, have an internal locus of control.

Internal locus of control is specific for self-determined learners and means perception of events and outcomes. In education, the internal locus of control refers to how learners perceive the causes of their academic success or failure. Self-determined learners attribute success to their endeavours and abilities, believe in self-control of their life events, consider themselves responsible for success and failure, and view the learning process as controllable and not difficult. They believe in their ability to grow with effort and to correct their performance by themselves. They quickly recognize their mistakes, difficulties, and setbacks. They follow an optimistic attitude, thrive in more unstructured learning environments, take responsibility for their actions and decisions, and provide more assistance, help, and support.

The self-awareness of self-determined learners brings clarity to their internal state. Self-determined learners can use self-insight and self-reflection to explore self-perception, self-knowing, and self-understanding. They foster their emotional intelligence and recognize how teachers and classmates see them. They have a deep understanding of their values, motives, and psychological needs, are realistic and self-critical, open to feedback, easily communicate their thoughts and emotions, understand and accept individual differences, and handle frustration and stress well. Self-determined learners become attentive self-observers. They make value judgments and feel the freedom to become self-accepting.

These qualities define a self-determined learner, but each is not necessary because of the developmental nature of self-determination. Self-determination emerges not only during school years when learners cultivate self-determination skills. The development of self-determination continues throughout all life span. Learners can experience different levels of self-determination skills during the maturation process.

Promoting self-determination, teachers may focus their instructional efforts on the qualities of self-determined learners. Teachers ought to understand the importance of self-determination as an essential educational outcome for all learners.

Self-determined learners are driven by intrinsic learning motivation and easy to accept learning challenges, which helps them be active and participate. Active participation in one's learning is highly effective in the context of twenty-first-century education (Triling, 2015; Freeman et al., 2014). Learners play an essential role in their learning process. They are encouraged to actively receive information from the teacher and build knowledge and understanding by engaging in the learning process. Active learning and self-determined learning agree with each other in learners' engagement in small or large activities like discussing, writing, presentation, and problem-solving or reflecting. The concept of deep active learning has recently enriched the concept of active learning. Matsushita (2018) presents a new concept of deep active learning as the type of learning that refers to learners' self-directed application of critical and creative thinking, problem-solving, communication, and collaboration. Active learning is an umbrella term and may cover the application of UDL principles in the learning process.

With widespread school closures during the COVID-19 pandemic, learners are temporarily being given distance education and they have started active learning outside of the classrooms. During this educational disruption, the learners were obliged and encouraged to test self-directed and active learning. It was about learning the course content and developing basic and essential features of self-directed learners.

Seeking a broader approach to expert learners' development, we selected the self-determination theory as a theoretical framework due to its conceptual breadth and applicability in inclusive education.

Comparing Self-Determined and Expert Learners help us to demonstrate how self-determination and expertise in learning are strongly related. Self-directed learners are on their way to becoming the experts of their learning processes (Biemiller & Meichenbaum, 2017).

Comparisons among self-determined and expert learners' qualities reveal self-determination theory as a solid theoretical background for expert learners' conception.

Having the sufficient theoretical basis for the concept of expert learners (see Fig. 2.1), we begin to search for significant characteristics of expert learners that could help us identify key milestones that each student can aspire to become the best he or she can be.

Fig. 2.1 Theoretical
background for the
development of expert
learners
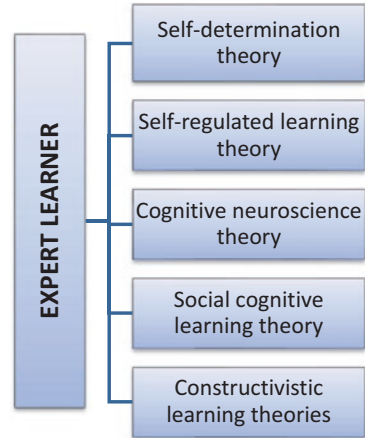
2.3 Characteristics of Expert Learners in the Context of Inclusive Education

The COVID-19 pandemic has disrupted schooling; therefore, inclusive education and development of expert learners must continue. Internals of expert learners should be interpreted with openness to diversity, change, and inclusive values sustainability.

According to Schwartz and Manning (2018a, b), active participation in learning processes distinguishes expert learners from classmates. We consider here several key differences of expert learners to reveal their dissimilarities wider.

Expert learners notice faster and understand deeper meaningful information. They organize information into domains around basic concepts more successfully. Their knowledge is not simply a list of facts and formulas relevant to some field. Consequently, expert learners organize, represent, and interpret information in more efficient ways. They more often mind the context of the applicability of knowledge. Expert learners make less attentional efforts when learning because learning material functions as a cognitive stimulant (Posner et al., 2010). They are more flexible in new situations. They are more likely to have metacognition (the ability to monitor their level of understanding and determine its adequacy). Expert learners want to learn deeply and know better how to learn and how they learn best.

In the minds of expert learners, both the problem and possible problem-solving strategies connect more strongly. When faced with a problem, they apply the known information and remember similar issues and strategies for solving them efficiently. The readily working retrieval system is specific for expert learners because they use short-term and long-term memory more efficiently without memorizing each piece of information.

Expert learners use stronger self-monitoring skills and better self-knowledge because they are more aware of when to verify the solutions, recognize their

strengths and limitations, and where the error was made during the task. It helps them to manage their learning as well, initiating opportunities to learn, setting personal learning goals based upon their own needs, skills, and interests, selecting the most effective learning strategies, evaluating the effectiveness of selected learning strategies, modifying the learning goal or action plan, and adapting their behavior to learning situations. They are more skilled in self-reflection and reflect on their learning more often, evaluating their progress, and attributing successes to their competencies and failures to correctable causes. Expert learners are characterized by solid self-regulation due to good metacognitive skills and strong resilience and persistence when facing barriers to learning. Their ability to learn independently is better developed, and they manifest creativity and curiosity more often.

More often and on purpose, expert learners take responsibility for their learning because they understand how they learn and manage their education. Accountability and the opportunity to choose are related. Expert learners are looking for meaningful learning choices and enjoy every possibility to decide for themselves. Since they know their learning needs and interests, dispositions, and capacities, it is easy for them to watch over their choices' positive and negative consequences. Along these lines, they realize themselves as active agents in the learning process, get a voice in their learning, and develop a sense of ownership in the learning process. When expert learners can make the choices, they tend to feel more responsible for their learning.

Expert learners do not give up so quickly when confronted with obstacles and distractions but try to find novel and effective ways of resolving the situation. Perkins (2014) offered a list of personal and interpersonal skills and knowledge worth developing in the twenty-first century and showed us that expert learners recognize that their initial understanding is likely to be incorrect or too simple, motivating them to watch out for solutions.

Expert learners are more aware of themselves as learners knowing their strengths and areas for improvement. So, they are more adaptive because they do self-monitoring while learning and have more learning strategies from which to choose.

Expert learners are more sensitive to task requirements due to greater metacognitive awareness. They can predict quite accurately which tasks are challenging and which are not. Expert learners more clearly comprehend why they fail and use the metacognitive awareness check for errors and redirect actions to attain a better solution. The most important questions they ask themselves are: How do we learn? How do we know that we have learned? How to direct our future learning? The Dunning-Kruger effect (illusory superiority) does not work on expert learners who are relatively independent monitors of the task performance and usually do not overestimate their abilities. That difference points to a meaningful distinction of expert learners—well-developed metacognitive awareness.

It is important to note that expert learners customary have high-quality teachers who are partners in learning (Auerbach et al., 2018). They seek support from teachers and listen to advice, though they make their own decisions. It is probably clear without specific study that even expert learners need help to improve their learning.

Seeking to provide insights into the development of expert learners, understanding the dissimilarities of their inner qualities is necessary. Analysis of expert

learners' differences could be very fruitful to determine the direction of actions for teachers who seek to develop the expert learners. Comparison of expert learners and learners in their way to expertise is valuable for giving specific guidelines for self-development of learners. Knowing what distinguishes expert learners from their classmates can help the teachers appropriately respond to the diversity of all learners. We write about dissimilarities of expert learners not because we do not believe that all learners can become experts, but because we aim to reveal how successful their learning learners look.

Scientists have long been trying to find out what characteristics are inherent for expert learners. Glaser and Chi (1988) listed and described seven key characteristics of experts: they excel mainly in their sphere; perceive large, meaningful problems in their sphere; are fast in performing the skills in their sphere; have superior short-term and long-term memory; see and represent a problem in the deeper level; spend a great deal of time analysing the problem; and have strong self-monitoring skills. Ericsson and Smith (1991) reviewed a broad range of approaches to the structure of expertise and expert performance. These authors highlighted the experts' ability to evaluate their performance and explain the reasons for setbacks. Weinstein and Van Mater Stone (1993) affirm that general education models come from conceptions of expert performance. However, teachers believe that an expert just knew more about something. They have summarized the five characteristics of experts: knowing more, organized and integrated, having effective and efficient strategies for accessing and using knowledge, having different motivations for acquiring and using knowledge, and having self-regulation. Ertmer and Newby (1996) characterized expert learners as strategic, self-regulated, and reflective. They recognized the reflection on learning to be an essential ingredient in the development of expert learners. These authors presented expert learners as strategic strategy users who use the gained knowledge in real-life situations and seek to achieve desired learning goals by selecting, controlling, and monitoring different learning strategies. Expert learners control the processes necessary for successful learning through self-control. The components of self-regulation are creating plans, monitoring their implementation, and evaluating the results achieved. Zimmerman (2000) described the characteristics of good self-regulated learners to reveal in what way naïve learners differ from expert learners and highlighted planning, organization, self-observation, and self-evaluation. Bransford et al. (2000) defined expertise as a continuum that runs from novice to expert. They presented the characteristics of expert learners based on key scientific findings that have come from the study of people who have developed expertise. The authors stated that expertise should not be associated with intellectual level or some characteristics of the memory. The expert learners have extensive, relevant, well-organized, and grounded foundational concepts knowledge to support their learning and improve understanding. Two types of expert learners were distinguished: adaptive and routine expert learners. Adaptive ones can transfer knowledge from one domain to another when conditions change, whereas routine expert learners function merely in standard conditions. According to Bransford et al. (2000), expert learners notice important aspects of information, understand the subjects deeply, analyze the context of applicability, and put little attentional effort. Sternberg

(2003) reviewed the expert learners' characteristics based on the theory of successful intelligence. Regretting the fact that many learners fail to learn up to their potential, the author indicated three kinds of expert learner-specific abilities: (1) analytical ability, which provides the expert learners with the opportunity to analyze, critique, judge, compare and contrast, evaluate, and assess; (2) creative ability which helps the expert learners to create, invent, discover, imagine if, suppose that, and predict; (3) practical ability which is needed for the expert learners to apply, use, put into practice, implement, employ, and render practical. According to the author, analytical abilities are necessary for an expert learner to determine whether ideas are good, creative abilities to generate ideas, and practical abilities to implement these ideas in practice. Chi (2006) analyzed two approaches to experts' characteristics: a fundamental approach to expertise as arising from chance or inner talent and a comparative approach as a level of proficiency that everyone can achieve. This author highlighted seven major ways in which experts excel: generating the best, fast, and accurate solution in solving a problem or designing tasks; perceiving the deep structure of a problem or situation; analyzing the problem qualitatively; having self-monitoring skills; choosing the appropriate strategy; being opportunistic when using resources; and retrieving knowledge and strategies with minimal cognitive effort. Woolfolk (2008) revealed three characteristics of expert learners: they focus their attention on materials learned, give the effort to process the information deeply, and take responsibility for their learning. Rahman et al. (2010) pointed out one of the important characteristics of expert learners: controlling their learning through meta-attention and meta-comprehension. These authors clarified expert learners as having a specific goal at the beginning of the lesson to help them focus and, consequently, monitor and evaluate their learning outcomes. According to Wild and Heck (2011), expert learners have three main characteristics: they actively engage with the learning material, take responsibility for their learning, and practice self-regulated learning by motivating themselves and guiding their learning. Stobart (2014) looked into six characteristics of expert learners: they develop their skills, want to be successful, apply knowledge in practice, organize information by creating models, look for feedback to improve their learning, and improve self-regulation. Meyer et al. (2014) described expert learners as purposeful, motivated, resourceful, knowledgeable, strategic, and goal-directed. Bray and McClaskey (2016) described how expert learners (learners with agency) develop and detected some of their characteristics. They understand how to manage their learning environment, know where to look for resources, know who to connect to their learning networks so they can collaborate and consult in any learning situation, and know-how to learn from their mistakes and develop a new understanding. Persky and Robinson (2017) named inner motivation and self-regulation as necessary characteristics of the expert learners who focused on mastery, increasing knowledge base, constantly practicing, being open to new experiences, and persisting toward a learning goal. Williams et al. (2017) focused on perceptual–cognitive expertise. They stressed that expert learners recognize and use task-relevant information provided by classmates or teachers, use probabilities and expectations in different situations, and focus on application.

McDowell (2019) attempted to identify the knowledge and skills learners must develop to become experts. They defined expert learners as persons who apply their knowledge and skills in various situations to solve problems and use orientation, activation, and collaboration skills to take control and improve their learning. According to this author, expert learners measure their knowledge and adapt learning strategies. They measure their performance, determine the following steps, reflect on their progress, and identify strategies to improve. They also visualize their understanding and give or receive feedback to improve learning for themselves, classmates, and teachers.

Darling-Hammond et al. (2020) emphasized the need to develop twenty-first century skills, which include:

– Critical thinking and problem-solving skills
– Capacity to find, analyze, synthesize, and apply knowledge to novel situations
– Interpersonal skills that allow people to work with others and engage effectively in cross-cultural contexts
– Self-directional abilities that enable them to manage their work and complex projects
– Capabilities to competently find resources and use tools
– Capacity to communicate effectively in many ways
– Strong self-regulation
– Executive functioning
– Metacognitive skills
– Resourcefulness, perseverance, and resilience in the face of obstacles and uncertainty
– Ability to learn independently; and curiosity, inventiveness, and creativity

This list of skills forms the belief that twenty-first-century learners are remarkably like expert learners as they have comparable abilities and qualities.

It is impossible to provide one single list of universal characteristics which can define an expert learner across all contexts and cultures. Current knowledge about neuroplasticity and the growth mindset directed our attention back to the universal design for learning and the qualities of an expert learner aligned with UDL guidelines.

2.4   Profile of Expert Learners Based on the UDL

According to the universal design for learning framework, expert learners are purposeful, motivated, resourceful, knowledgeable, strategic, and goal-directed. However, we can expand these properties.

1. Expert learners know what they want to achieve and why it is crucial. The goals they are setting are clear to them.
2. Expert learners possess high expectations and recognize that they can progress in achieving their goals.

3. Expert learners know how to use relevant resources and adjust strategies and choices to reduce barriers to learning.
4. Expert learners understand that learning takes effort and appreciate mastery-oriented feedback.
5. Expert learners see challenges as opportunities to learn and expand their knowledge.
6. Expert learners use introspection. They reflect on how resources have helped them overcome barriers to learning, why specific goals were not met, and how choices might be made more appropriately next time.

In the video,[1] Professor David Rose, co-founder of the Centre for Applied Special Technology (CAST), talks about the expert learners as follows:

1. Expert learners are focused on a goal, influenced by internal motives, they do not need to be told what to do. They have plans, solve problems, invent, and learn how to make new things.
2. Expert learners are knowledgeable, but they want to know even more. They know how to find information and what information is valuable to them.
3. Expert learners take great care of their learning. They invest their emotions and feel pleasure when learning new things. They do not wait for someone to help them. They manage frustration and maintain their motivation and involvement even if they fail sometimes.

Meyer et al. (2014) suggested new insights into becoming a learning expert. The authors warned that expert learners do not necessarily know more than other learners and defined them as continually learning, growing, and improving. According to the authors, the key to expert learning is self-knowledge. Therefore, expert learners are self-aware and active: they know how to solve problems flexibly, change or adapt after mistakes, and select learning strategies successfully. They know how to engage deeply in their learning: to learn in a social context, observe other people as models, and change the approach after receiving feedback. Expert learners make an effort to elaborate and improve their skills and abilities and know that learning is a continuous process.

Expert learners have been defined comprehensively by the CAST (2018) when scientists who worked there looked at neuroscience and cognitive science. They integrated the characteristics of expert learners into three units: (1) purposeful and motivated expert learners, (2) resourceful and knowledgeable expert learners, (3) strategic and goal-directed expert learners.

Each of these three characteristics of expert learners has more detailed qualities (see Tables 2.1, 2.2, and 2.3 in the Appendix) based on the theory of self-determination and four versions of the UDL Guidelines (CAST, 2008, 2011, 2014, 2018). We present the qualities of expert learners on three levels, from more abstract to more specific ones (Qualities 1, Qualities 2, and Qualities 3).

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[1] https://www.youtube.com/watch?v=8HykYqfn79c.

As presented in Table 2.1 (see the Appendix), *purposeful and motivated expert learners* are interested, uphold effort and persistence, and self-regulating. The main qualities of these learners are as follows:

- These learners are attentive and engaged through choice and autonomy. They prioritize authenticity, value, and relevance. Furthermore, they are resistant to barriers, distractions, and threats.
- These learners are persistent. They demonstrate concentration when learning. They set essential goals and objectives, identify suitable resources. They value collaboration and feedback.
- These learners exemplify self-regulation through positive expectations and beliefs. They cope with stress and use self-reflection and self-assessment.

The first UDL principle of providing multiple means of engagement is closely related to the qualities of purposeful and motivated expert learners listed above.

Resourceful and Knowledgeable Expert Learners These are portrayed in Table 2.2 (see the Appendix) as perceiving, mastering language and symbols, and comprehending. The main qualities of these learners are as follows:

- These learners percept through access and adjustment of information in different modalities. They use alternatives for visual and auditory information.
- These learners recognize, memorize and internalize of language symbols. They do it through information decoding, syntax and structure understanding.
- These learners comprehend through background knowledge, fundamental relationships, patterns, ideas, and features. They transfer, generalize process, and visualize.

The second UDL principle of providing multiple means of representation is closely related to the qualities of resourceful and knowledgeable expert learners listed above.

Strategic and Goal-Directed Expert Learners These are described in Table 2.3 (see Appendix) as operating physical actions, mastering expression and communication, and carrying out executive functions. The main qualities of these learners are as follows:

- These learners like physical activity. They seek it through varied learning methods and technologies.
- These learners use communication and expression through multimedia. They like multiple tools, practice, and performance.
- These learners perform executive functioning through management of resources. They are setting goals, planning strategies, and monitoring progress.

These qualities of strategic and goal-directed expert learners listed above are closely related to the third UDL principle of providing multiple means of action and expression.

2.5   Discussion and Conclusions

In inclusive education and application of UDL strategy for the development of expert learners, we considered which qualities of expert learners are the most essential because these would be presented in tables. We evaluated priorities keeping in mind the teachers' activities when developing these learners. For example, if the teachers' goal is to stimulate the interest in learning, we determined that the most crucial quality of expert learners was "being interested" (i.e. maintaining their attention and engagement). Identifying some of the critical attributes of expert learners and thoroughly analysing how they relate to the three fundamental characteristics examined by the UDL guideline could serve as a road map for teachers who want to carry out significant activities concerning the development of expert learners.

An expert in society has special skills or knowledge about a particular subject derived from extensive experience. An expert learner in the classroom is someone who is in the process of becoming an expert, mastering his or her specific knowledge, skills, and beliefs (Persky & Robinson, 2017). Meyer et al. (2014) present expertise not as a destination but as a process of becoming more expert because learning is a process of continuous change and growth.

Most scientists who investigated the developmental process of the expert learner believed that every student could become an expert learner because everyone can develop. Expert learners are nurtured through their motivation to overcome difficulties, practice, reflection on where they are challenged, self-regulation, executive functioning, situational awareness, and reduction or surmounting barriers (Meyer et al., 2014; McClaskey, 2016; Tobin & Behling, 2018). It seems that the key to expert learning is the personification of the self as a learner through an awareness of one's needs, strengths, and challenges (Hollins, 2018). Hartman (2015) affirms that all students are expert learners. Such a statement needs clarification as becoming an expert learner requires an empowering and supportive environment.

The students who had problems in learning must have the potential to develop as expert learners through the promotion of greater independence, achievability of learning goals, use of accessible learning materials, and enhancement of skills and knowledge. Learners with disabilities, like all learners, should be included and have access to multiple means of representation, action, and expression.

Darling-Hammond et al. (2020) posit that knowledge is rapidly expanding in the twenty-first century. The ability to find, analyze, synthesize, and apply knowledge to novel situations is essential nowadays. The development of such skills requires a different kind of teaching and learning in which the learning reveals itself as not the reception of facts and teaching as not the transmission of information.

We used Deci and Ryan's (1985, 2012) self-determination theory as a theoretical framework for the expert learners' concept due to its conceptual breadth and applicability in inclusive education.

Purposeful and motivated expert learners are engaged in learning, desirous for new knowledge, and motivated by learning itself. They know how to set learning goals for themselves and sustain effort and resilience when reaching those goals. They monitor and regulate emotional reactions that would distract them from

successful learning. Purposeful and motivated expert learners can reflect on their education without having to be asked to do so. They reflect on what is going well or worse and find the areas to improve, relying on current strengths. In this way, they can make learning more personal. When the learning material is not necessarily interesting for them, they find the means to connect it to something fascinating to them.

Resourceful and knowledgeable expert learners are mastering language and symbols and comprehending. They recognize the tools and resources that would help them find, structure, and remember new information. They know how to identify, prioritize, and assimilate new information presented in the classroom and how to transform that information into meaningful and usable knowledge that they can put into practice. Resourceful and knowledgeable expert learners can apply the tools, methods, and resources that support the learning process and—this is very important—they also fearlessly ask the teachers for instructional scaffolding to facilitate their learning and help in the mastery of tasks. They are looking for means to comprehend clearly and to redevelop or to reconceptualise the learning material.

Strategic and goal-directed expert learners are operating physical actions, mastering expression and communication, and caring for executive functions. They usually have learning goals in mind and therefore possess the plans to achieve these goals. So they need to monitor their learning and employ effective learning strategies to optimize it, rejecting the process that turned out to be ineffective. Strategic and goal-directed expert learners are developing strong metacognitive skills. For that purpose, they seek to assess themselves as having some strengths and weaknesses and reinforce their strengths and work on their weaknesses. Strategic and goal-directed learners develop their executive functions using different tools and means effectively. They are looking for possibilities to be active and strategical when learning.

The concept of "development of expert learner" in some countries' education systems (e.g. Lithuanian and Polish) is entirely new. The terms "teacher experts", "student support experts", and eventually "education experts" are already used, but "expert learner" is not yet. Specific Austrian, Finnish, Lithuanian, and Polish schools have already applied action research, and teachers have already implemented UDL principles for the development of expert learners. Upon completing this research, we can state that students' development to become expert learners was undoubtedly challenging. Sharma et al. (2019) investigated the barriers to implementing inclusive education and identified the most significant obstacle: inadequate teacher preparation. The teachers and researchers of Austria, Finland, Lithuania, and Poland have had particular and valuable experiences applying inclusive education principles through the UDL strategy.

In summary, teachers can nurture purposeful, motivated, resourceful, knowledgeable, strategic, and goal-directed learners who understand the importance of such qualities. By creating personalized learning environments, supporting learning, developing critical skills, and monitoring progress, teachers can work with their students to help them become expert learners. The following chapters of this book will reveal how schools have implemented the principles of the universal design for learning framework to develop more expert learners.

Appendix: Qualities of Expert Learners

Table 2.1 Qualities of purposeful and motivated expert learners

Qualities 1	Qualities 2	Qualities 3
1. Interested (maintaining their attention and engagement)	1.1. Autonomous	1.1.1. Chooses the learning objectives themselves 1.1.2. Chooses how to reach objectives and employ available tools or supports 1.1.3. Feels proud because of their accomplishment and stays connected to their learning 1.1.4. Selects the right kind of choice and demonstrates an adequate level of independence 1.1.5. Evaluates the level of challenge, possible rewards, or recognition 1.1.6. Practices and assesses their skills 1.1.7. Sets their personal academic goals
	1.2. Orientates to authenticity, value, and relevance	1.2.1. Accumulates information and performs activities that are relevant and valuable to their interests and goals 1.2.2. Believes in the utility and relevance of learning 1.2.3. Performs authentic and meaningful activities through active participation, exploration, and experimentation. 1.2.4. Implements personal evaluation and self-reflection to learning content and learning activities 1.2.5. Uses imagination when solving novel and unusual problems or analysing complex ideas creatively
	1.3. Picking up with distractions, barriers, and threats	1.3.1. Overcomes or reduces the potential threats and distractions contained in the learning environment 1.3.2. Changes the level of novelty or risk 1.3.3. Uses tools that can increase the predictability of daily learning activities and changes in it 1.3.4. Searches for something novel, surprising, and unexpected when performing the highly routinized activities 1.3.5. Maintains an adequate level of sensory stimulation 1.3.6. Actively participates in whole-class discussions

Table 2.2   (continued)

Qualities 1	Qualities 2	Qualities 3
2. Upholds effort and persistence (controls their attention and affection to maintain concentration when learning)	2.1. Considers goals and objectives important	2.1.1. Foresees the rewards of reaching their goals 2.1.2. Sustains efforts and concentration when confronted with distraction 2.1.3. Divides long-term goals into short-term objectives 2.1.4. Uses scheduling tools. 2.1.5. Visualizes the desired outcome 2.1.6. Participates in assessment discussions about excellence
	2.2. Optimizes the challenge through diversification of resources	2.2.1. Needs to be challenged 2.2.2. Searches and finds the suitable and beneficial resources necessary for successful completion of the learning tasks 2.2.3. Finds challenges that can optimally motivate them
	2.3. Fosters collaboration	2.3.1. Communicates and collaborates effectively 2.3.2. Knows when and how to ask for support 2.3.3. Provides support by themselves 2.3.4. Holds the expectations for group work
	2.4. Aspires for mastery-oriented feedbacks	2.4.1. Seeks for mastery-oriented, relevant, constructive, substantive, informative, accessible, consequential, and timely feedbacks 2.4.2. Supports the self-motivation and efforts essential to their learning 2.4.3. Maintains perseverance 2.4.4. Maintains self-efficacy and self-awareness 2.4.5. Uses specific supports and strategies when challenged 2.4.6. Identifies patterns of errors and wrong answers to succeed in the future
3. Self-regulating (strategically modulates their emotional and behavioral reactions to be more effective in learning)	3.1. Maintains motivation through expectations and beliefs	3.1.1. Knows about what they find motivating 3.1.2. Has positive beliefs that their goals can be reached 3.1.3. Copes with frustration, outbursts of anger, and anxiety when reaching their goals 3.1.4. Increases the length of performance in the face of distractions 3.1.5. Increases the frequency of self-reflection and self-reinforcements 3.1.6. Considers both their strengths and limitations
	3.2. Fosters personal coping skills and strategies	3.2.1. Copes with their emotional responses to some internal or external events 3.2.2. Seeks external emotional support 3.2.3. Develops and demonstrates self-control and coping skills 3.2.4. Handles specific phobias and negative judgments about their aptitudes
	3.3. Employs self-assessment and reflection	3.3.1. Monitors their emotions and reactivity 3.3.2. Uses metacognition purposefully 3.3.3. Identifies and uses different and optimal self-assessment techniques 3.3.4. Monitors changes in their performance

Table 2.2 Qualities of resourceful and knowledgeable expert learners

Qualities 1	Qualities 2	Qualities 3
1. Perceives (accesses and adjusts information through different modalities)	1.1. Chooses ways to display information	1.1.1. Perceives information clearly 1.1.2. Makes connections within and between concepts effectively
	1.2. Uses alternatives for auditory information	1.2.1. Uses text and visual equivalents and written transcripts when needed 1.2.2. Uses visual analogues to represent emphasis.
	1.3. Uses alternatives for visual information	1.3.1. Uses text or sound descriptions for images, graphics, video, or animations 1.3.2. Uses touch equivalents 1.3.4. Uses physical objects and spatial models
2. Masters language and symbols (recognizes and memorizes language symbols in learning materials and internalizing them for thinking on)	2.1. Understands the vocabulary and symbols	2.1.1. Associates representations of their meaning 2.1.2. Connects vocabulary and symbols to their experience and prior knowledge 2.1.3. Uses graphic symbols with alternative text descriptions 2.1.4. Transforms complex information to simpler ones 2.1.5. Searches for support when facing unfamiliar information
	2.2. Understanding the syntax and structure	2.2.1. Combines single elements of meaning to make new meanings 2.2.2. Understands the rules, structures, and structural relations 2.2.3. Makes connections to previously learned structures 2.2.4. Makes relationships between elements
	2.3. Employs the decoding of the information	2.3.1. Decodes information presented in an encoded format 2.3.2. Comprehends and processes information 2.3.3. Uses the lists of key terms
	2.4. Understands across languages	2.4.1. Uses both domain-specific and standard terms.
	2.5. Illustrates through multimedia	2.5.1. Uses multimedia to make information more understandable and accessible

Table 2.2 (continued)

Qualities 1	Qualities 2	Qualities 3
3. Comprehends (actively transforms accessible information into useable knowledge)	3.1. Possesses the background knowledge	3.1.1. Assembles the necessary knowledge 3.1.2. Accumulates the background knowledge 3.1.3. Activates prior knowledge 3.1.4. Uses knowledge organizers 3.1.5. Connects concepts with relevant analogies 3.1.6. Understands cross-curricular connections
	3.2. Grasps the fundamental relationships, patterns, ideas, and features	3.2.1. Distinguishes what is essential from what is unimportant 3.2.2. Assimilates the valuable information into available knowledge 3.2.3. Uses learned skills to solve problems
	3.3. Implements the information processing and visualization	3.3.1. Uses cognitive strategies to summarize, categorize, prioritize, contextualize, and remember the information 3.3.2. Uses information processing strategies successfully 3.3.3. Divides information into more minor elements 3.3.4. Removes distractions
	3.4. Employs the transfer and generalization	3.4.1. Transfers their knowledge to new contexts 3.4.2. Uses mnemonic strategies and devices 3.4.3. Seeks for opportunities to review and practice 3.4.4. Installs new ideas in customary contexts 3.4.5. Generalizes learning to new situations 3.4.6. Reconsiders ideas and links between ideas

Table 2.3 Qualities of strategic and goal-directed expert learners

Qualities 1	Qualities 2	Qualities 3
1. Operates physical actions (using learning strategies leaned on the actions)	1.1. Uses varied methods when performing the learning tasks	1.1.1. Manages the motor demands of the tasks 1.1.2. Uses multiple means for actions 1.1.3. Interacts with materials physically
	1.2. Exploits varied tools and technologies	1.2.1. Uses the tools effectively 1.2.2. Uses tools for full participation in learning
2. Masters expression and communication (uses alternative means for the expression of ideas and concepts)	2.1. Uses multimedia for communication	2.1.1. Uses a wide range of expression 2.1.2. Composes in multimedia successfully 2.1.3. Uses physical manipulatives 2.1.4. Uses social media and interactive web tools 2.1.5. Solves problems using a variety of strategies
	2.2. Uses multiple tools for construction and composition	2.2.1. Uses different software, webs, applications, and tools
	2.3. Looks for support in practice and performance	2.3.1. Seeks a variety of flows 2.3.2. Practices independence 2.3.3. Searches opportunities for performance 2.3.4. Performs their learning in personally relevant ways 2.3.5. Seeks personalized feedback 2.3.6. Uses novel solutions to authentic problems
3. Carries out the executive functions (sets goals, plans effective strategies for reaching those goals, monitors progress, and modifies approach as needed, and overcomes impulsive reactions)	3.1. Sets the appropriate goals	3.1.1. Sets appropriate goals to guide their work 3.1.2. Sets the goals effectively 3.1.3. Assesses efforts, resources, and difficulties
	3.2. Implements the planning and varied strategies	3.2.1. Plans the strategies to reach the goals 3.2.2. Uses strategic planning 3.2.3. Uses "stop and think" strategy 3.2.4. Uses "show and explain" strategy 3.2.5. Sets up priorities, sequences, and schedules of steps after understanding the problem 3.2.6. Uses "think-aloud" strategy 3.2.7. Breaks long-term goals into short-term objectives
	3.3. Manages the information and resources	3.3.1. Uses organizers and models for collection and organization of information 3.3.2. Categorizes and systematizes the information 3.3.3. Uses note-taking.
	3.4. Monitors progress	3.4.1. Has a clear and correct picture of their progress 3.4.2. Knows what to improve 3.4.3. Seeks feedback that is more accessible, timely, informative, and explicit 3.4.4. Monitors their progress effectively and guides their effort and activity by using the monitoring information 3.4.5. Asks questions to themselves 3.4.6. Spotting representations of their progress. 3.4.7. Self-reflects on quality and completeness 3.4.8. Self-assesses by multiple means

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Chapter 3
Theoretical and Methodological Validation of the Action Research: Methodology of the Scientific Study

Ona Monkevičienė and **Alvyra Galkienė**

Abstract This chapter presents the theoretical and methodological substantiation of the action research, which was used by collaborating research teams from Poland, Lithuania, Finland and Austria for the study "Improving Inclusive Education Through Universal Design for Learning". The chapter discusses different sociocultural contexts in the participating countries and what led to the research question, which asks "How does the implementation of universal design for learning enrich the practice of inclusive education in different educational contexts". This question was looked at in terms of its relevance to the four above-mentioned countries. It can be argued that the action research is favourable for the development of theory and that inclusive education can be changed and reflected by it. The types of action research chosen by the research teams are discussed, those being collaborative, and critical participatory. The cycles of action research and their goals are also presented. Seeking to substantiate the choices of research teams regarding the process and methods of action research, this chapter elaborates on the aspects of action research organisation that are interpreted differently by the researchers: Can the action research be conducted only by the researcher–teachers or can it be carried out by teachers in cooperation with researchers? Is it possible to use a combination of qualitative and quantitative research? The problem with quality and validity of action research is discussed.

Keywords Action research · Transformation of education · Methods of action research

O. Monkevičienė (✉) · A. Galkienė
Vytautas Magnus University, Educational Aacademy, Kaunas, Lithuania
e-mail: ona.monkeviciene@vdu.lt; alvyra.galkiene@vdu.lt

3.1   Theoretical Perspective of the Research

The theoretical framework of the study is based on the theory of social constructivism, introduced by Vygotsky (Scheurman, 2018), and theories of educational neuroscience. Scheurman (2018) supports the idea of Piaget's constructivism and explains Vygotsky's theory on how social and cultural contexts influence the authentic construction of a child's understanding. In terms of social constructivism theory, knowledge is co-constructed in the child's interaction with others, as well as with his or her social and cultural environment. The teacher is seen as a collaborator and provides scaffolding (expert support) for learning. According to Wilson (1996), the sociocultural theory of Vygotsky (1978) highlights the significance of the child's authentic learning experiences towards the construction of their own cognitive processes and strategies for world understanding. This is accomplished with the employment of the following cultural tools: scaffolding, dialogue, collaboration and language. The theories of educational neuroscience present a scientific understanding of brain–behaviour relationships, which allow for the development of new learning and teaching strategies (Jamaludin et al., 2019). The above-discussed theories substantiate the understanding of the approach investigated by the Universal Design for Learning and its improvement applied to inclusive education from multiple theoretical lenses (Hackman, 2008, Meyer et al., 2014).

The Goal and Objectives of the Research The purpose of the study is to better understand how the implementation of universal design for learning enriches the practices of inclusive education in different educational contexts.

The objectives of the research are to employ the Universal Design for Learning (UDL) methodology to:

(a) Reveal the transformations of the educational process in an inclusive classroom
(b) Identify the educational factors facilitating a student becoming an expert learner
(c) Reveal the pedagogical competence of teachers for a diverse set of students
(d) Re-interpret existing inclusive education practices in the classroom

The Context of the Research The research was conducted implementing the project "Preconditions of Transformation of Education Process in Different Educational Contexts by Applying Inclusive Education Strategies" (Erasmus+, No. 2018-1-LT01-KA201-046957, 2018–2021). Researchers and school teachers from four countries and various educational settings, all of whom have been exploring research-based solutions for improving inclusive education, made up the international research team. Researchers from the University of Vienna, Austria, joined teachers from LWS Steinbrechergasse, a local school in Vienna; researchers from the University of Cracow, Poland, teamed up with local teachers from Zespol Szkol Ogolnoksztalcacych No. 9; researchers from Vytautas Magnus University, Lithuania, joined teachers from Vilniaus Balsiu mokykla, a school in Vilnius; finally, researchers from the University of Lapland, Finland, partnered with local teachers from Aleksanteri Kenan koulu.

The countries all experience different socio-educational contexts in the implementation of inclusive education. In Lithuania and Poland, inclusive education is still in a phase of active transformation. In Austrian primary schools, it has been actively implemented since 1993 and in secondary schools since 1996 (School Organization Act). However, challenges have been encountered in coping with immigration and socially disadvantaged situations (Galkienė, 2017). National projects have been implemented in Finland since 1997 and have contributed to a wide adoption of inclusive education's main principles. Since 2014, special attention has mainly been paid to ensuring the child's well-being (Galkienė, 2017). At present, the main focus in Finland is on developing the pedagogical competence of inclusive teachers.

In a joint discussion, the international research team identified problem areas in the quality of inclusive education in their countries and directions for its improvement: The concern in Poland centred around the replacement of routine lessons with methods applied by teachers, using the way schoolchildren learn to improve the quality of inclusive education; in Lithuania, it is about the promotion of schoolchildren's self-regulated learning and developing their qualities and abilities in the context of having them be expert learners; Finland aims to develop teachers' professional competencies, which enable them to teach a wide range of students; Austria seeks to re-interpret the existing practices of inclusive education by striving for a higher quality of this type of education. The researcher team also discussed the possibilities of applying UDL to help improve inclusive education in specific problem areas. It was decided that researchers and school teachers from all four countries would implement the UDL approach in schools, and assess its transformative impact in order to improve the quality of inclusive education in the identified problem areas.

3.2 Methodological Approach of the Participatory and Collaborative Action Research

Action Research as Transformational Power The international research team chose action research after taking into consideration the aim and nature of the inquiry in question. This choice was made because such research *is appropriate for planning, implementing, investigating and reflecting on the improvement of inclusive education quality*. A theory is usually developed while action research is taking place. Simultaneously, a practical intervention is introduced to help understand and characterise processes and their results. It is believed that social systems and phenomena are easier to comprehend if attempts are made to change them. According to Cohen et al. (2013), action research is a powerful means for change and improvement. It possesses the potential power to initiate a change at school (Ferrance, 2000). According to Rowe et al. (2013), action research may initiate not only changes that are developmental or transactional but also ones that are transformational. Transformational changes are more radical compared to developmental or

transactional ones because they embrace not only improvement of existing practices, structures and procedures but transformation of values, goals, roles, relations, learning and thinking of individuals, teams and organisations. The researchers state that action research is an efficient methodological approach for developing inclusive education (Charalampous & Papademetriou, 2019; Armstrong & Tsokova 2019).

Action Research Approaches Since one can use it with various approaches, action research is convenient. Researchers frequently systemise action research according to type: individual teacher research, collaborative action research, school-wide research, etc. (Ferrance, 2000), classroom action research, as well as emancipatory, participatory and critical participatory action research (Kemmis et al., 2014). In all types of action research, participants raise questions and solve a real problem in a local environment, in a specific context and with the intention of sharing new knowledge with others. The implementers of the research perform the roles of practitioners and researchers. Thus, action research is conducted in the context of a participatory paradigm and, for this reason, it is referred to as participatory action research. Morales (2016) and Datta et al. (2015) identify other features of action research, such as collaboration among all the participants, co-learning, joint conducting of research and group reflections and creating new knowledge and meaning. Meanwhile, other researchers single out a separate type of action research, i.e. collaborative action research (Ferrance, 2000; Charalampous & Papademetriou, 2019).

Two types of action research—participatory and collaborative—are employed in the present research with an emphasis on the participatory approach, which prevails in participatory action research. However, the process of action research also possesses features of a collaborative approach. Nevertheless, the collaborative approach dominates in the process of collaborative action research but the action research naturally relies on the participatory paradigm.

Participatory Action Research The Austrian team of researchers chose critical participatory action research. While carrying this out, attempts were made to connect all the social groups that were participating in the pedagogical practice and interact through it as a means of introducing changes in existing pedagogical practices at school (Kemmis et al., 2014). According to the above-mentioned authors, critical participatory action research aims to change three areas: the way in which practitioners practice (in this case, teachers and other participants in the educational process), their understanding of their own practices and conditions under which they practice (Kemmis et al., 2014, p. 63). Participatory action research is typically coordinated by the participants themselves, its model being democratic and its success focused on personal and collective change (Morales, 2016; Jacobs, 2016).

Participatory action research proved useful for attaining the goal set by the Austrian team of researchers: to re-interpret existing inclusive education practices in the classroom under the perspective of the UDL methodology. Participating teachers, students and parents identified good practices of inclusive education, as well as barriers that work against it. Together, they developed a research and action plan, and reflected on learner outcomes.

Collaborative Action Research The Polish, Lithuanian and Finnish research teams used collaborative action research, where school and university teachers acted as co-researchers. The Polish group employed collaborative action research to reveal transformations to the educational process that took place when an inclusive classroom employed the UDL methodology; the Lithuanians employed the UDL strategy to identify the educational factors facilitating a student becoming an expert learner. The Finns used it to reveal the pedagogical competencies involved with teaching to a diverse group of students. The participatory action research conducted in Austria included collaboration between university researchers and teachers.

Collaborative action research is considered to be an efficient strategy for transforming a settled practice in schools to achieve clear goals for its improvement and as a way to both improve teachers' professional competencies and create knowledge free from the boundaries of theory and practice (Mertler, 2019a; Rowell et al., 2017, Alber & Nelson, 2002). Some researchers (Kemmis et al., 2014) express a position that action research has to be carried out by teachers themselves, since this type of research involves a self-reflective and self-transformative process. However, the studies conducted by the teachers and researchers working together contradict this approach (Charalampous & Papademetriou, 2019; Kapenieks, 2016). In the research carried out by Olander and Holmqvist Olander (2013), teachers joined researchers to design and reflect on lessons, with the results of one planned and delivered lesson of biology serving as a basis for planning a second and then a third lesson. Olander and Holmqvist Olander (2013, 210) state that teachers' collaboration with researchers allowed them to identify what students do not know and to design efficient lesson models. Moreover, such collaboration "is an important tool and has potential to scaffold teachers' professional development". The results of the research presented by Messiou (2019) show that collaborative action research encourages the development of inclusive thinking and improves inclusive education practices.

The collaborative dialogue of school teachers and university lecturers, which led to deeper reflection, was one of the essential features of "Improving Inclusive Education Through Universal Design for Learning", the international action research presented in this study. Teachers and researchers from Poland, Lithuania, Finland and Austria acted as co-researchers from the first stages of the action research process to the end. Researchers from universities in all the countries chose participating schools and where authorities and teachers would volunteer to join the projects. They also sought out and tested new strategies of inclusive education that aim to improve the quality of both inclusive education and student achievement in their schools. As mentioned above, university researchers and school teachers together held discussions about the problems with the quality of inclusive education in their countries, as well as changes that would need to be introduced. In their joint discussion, all the researchers and school teachers chose the UDL approach, predicting that its implementation could have a transformative impact in improving the quality of inclusive education in the problem areas identified in each country. The researchers and teachers all participated in the training courses, where lecturers from the organisation CAST, which has created and has been developing this approach, presented conceptual and practical aspects of UDL. The researchers and

teachers together participated in the CAST webinars, which focused on such topics as "The conception and principles of UDL", "Design of socio-educational environment based on the UDL principles", "Planning the process of education, based on UDL principles", "Implementation of UDL-based learning-teaching methods in the process of education. Observation and analysis of teaching videos using the UDL lens" and "Designing of UDL-based classroom settings and teaching/learning supplies" (2018). The researchers and teachers shared insights on contextualisation of UDL at school and its use for lesson planning. They looked at this through the prism of striving for a better quality of inclusive education, more ways of learning that best suits students and more goal-oriented learning. After every cycle of action research, a joint discussion was held with the Polish, Lithuanian, Finish and Austrian research teams. Teachers spoke with researchers while they also debated within their own separate groups.

Researchers and school teachers from all participating countries designed models of action research tailored to the problems that had been analysed, devised a three-point plan of action research and set goals for each phase. Discussing with the researchers and collecting data from others participating in the education process (learners and parents), the teachers from Poland, Lithuania and Finland identified the strengths of inclusive education, areas for improvement, and barriers in the educational process that prevent students from experiencing learning success in their schools. They also foresaw UDL-based actions that would eliminate barriers in the education process. Together with teachers, the researchers discussed the methods of data collection. The researchers observed the lessons delivered by teachers and, based on the results of previously taught lessons, discussed with teachers the planning of new lessons. The application of a UDL approach during lessons was also discussed among teachers. The teachers alone, as well as with the researchers, reflected on the results, problems and barriers of each cycle of action. As mentioned above, participatory action research was carried out in Austria, where teachers, students, parents and researchers participated in all stages.

To ensure the success of the joint researcher–teacher approach, researchers need to establish certain principles and conditions: a two-way empowering relationship with teachers (Datta et al., 2015); a clear discussion on research methods and process, as well as roles; scaffolding that helps teachers plan their activities (Mertler, 2019b); reflections and participation in the learning process to form the foundation for improving teachers' educational practice; reflections that need to be grounded in mutual trust and open to discussions surrounding difficulties (Insuasty & Jaime Osorio, 2020). All these conditions had been embedded in our research, with the resulting collaboration between researchers, teachers and other participants in the action research being warm, open and based on critical dialogue, reflection and scaffolding.

3.3 Cycles of Action Research

Action research is a cyclical process that involves identifying areas where there are problems and room for improvement, devising an action and implementation plan, setting up data collection, assessing and reflecting action and changes, and modifying the action plan. These all need to be considered for results to occur (Ferrance, 2000; Cohen et al., 2013; Charalampous & Papademetriou, 2019). Models of action research vary. Although the research teams from Poland, Lithuania, Finland and Austria applied different models of action research, all but one comprised three cycles (with Austria comprising two), which we present below.

The first cycle is aimed at analysing the context of inclusive education's problem areas that were identified in Polish, Lithuanian, Finnish and Austrian schools, as well as identifying a specific research problem. Applying the UDL approach in the school of each country, best practices for organising inclusive education were evaluated and student learning barriers were identified from the perspective of teachers and students (The Austrians and Poles also identified barriers from the perspective of parents). Possible areas for improvement were identified, as were how the application of UDL can contribute to that improvement.

The second cycle applies the UDL approach as a means of eliminating student learning barriers identified in the first cycle and to improve the quality of inclusive education. Traditional routine teaching and learning was replaced with an educational processs grounded in the principles of UDL; the UDL approach was applied to help develop the qualities of students as expert learners; practices of inclusive education were re-interpreted and renewed in the context of the UDL approach; in the process of inclusive education and applying the UDL approach, teachers came together to reflect on the competencies that help them facilitate teaching a diverse set of learners. This second-cycle reflection touched on changes in the practice of teaching and learning, as well as in the attitudes of teachers and other participants, the factors that enhance the quality of inclusive education, and unresolved or newly identified barriers to student learning.

In the third cycle, the UDL approach was applied seeking to enhance the good practices of inclusive education, which had been modelled in the second cycle, and to eliminate the barriers to students learning, which had not been coped with in the second cycle or emerged anew. The change in the practice of teaching and learning as well as in the attitudes of teachers and other participants in the process of teaching, the factors that strengthen the quality of inclusive education, unresolved or newly identified challenges to further improvement of the quality of inclusive education students' learning were reflected on in the third cycle. The third cycle of action research conducted by Finnish researchers focused on reflecting the teachers' competence to work with a diversity of students in the classroom applying UDL.

It just so happened that due to the coronavirus outbreak the schools faced a problem in the third cycle of research. Challenges with distance learning begat new questions: How can the inclusive process be organised in the online classroom and made accessible to all students, including SEN learners; What are both the

advantages and disadvantages of distance learning that make it possible or impossible to ensure inclusion for all students or individual learners; How does the UDL approach help to adapt to unexpected challenges and make the experience more dynamic?

3.4 Research Methods

The data collection in the action research aims to identify a specific problem, to then foresee what will be improved prior to devising an action plan. Implementing it requires reflection on changes in practices and attitudes and factors that had led to those changes (after implementation of action plan). The accumulated data enable understanding of what is going on in the classroom and what participants in the process of teaching and learning think about and how they approach their work. It also helps to identify actions that can stimulate changes that result from a specific action and how that result can be predicted and achieved. The methodology of action research is associated with a qualitative paradigm over a long period of time. For this reason, it seemed most appropriate to apply qualitative data collection and analysis methods (Dosemagen & Schwalbach, 2019, 163). However, other researchers have expanded the field of methods applied in the action research and have used a mixed research approach (i.e. combining qualitative and quantitative methods) (Charalampous & Papademetriou, 2019). While they evaluated and understood their work by applying qualitative methods, their results were measured with quantitative methods (Parker et al., 2017). Ivanova and Wingo (2018) substantiated conceptual, philosophical and procedural aspects of using a mixed-method approach in action research. A multi-method approach is applied in the presented research, applying either qualitative research methods on their own or combining both qualitative and quantitative (Charalampous & Papademetriou, 2019). Various methods of data collection and analysis were used: interviews, diaries, video and audio recordings, questionnaires, etc. (Ferrance, 2000). It should be noted that qualitative methods of data collection and analysis prevail even when a mixed approach to research methods is followed.

A multi-method approach was applied in the research conducted by the Polish, Lithuanian and Finnish research teams while a qualitative research approach was applied in the research conducted by the Austrians. A more detailed description of applied methods is provided in chapters where the research results are presented.

The action research was conducted following all the ethical requirements. Informed consent (from students, their parents, teachers, school authorities) was obtained. To ensure confidentiality, the names of children and teachers were changed to pseudonyms and no details that could be linked with a particular person were presented. While writing the study, the participants in the research were provided with information on the research results.

3.5   Quality and Validity of Action Research

Bradbury et al. (2019, 25) state that the quality of action research is ensured by (1) clearly defined goals, (2) partnership and participation, (3) contribution to action research theory practice, (4) appropriate methods and process, (5) actionability, (6) reflexivity and (7) significance. To ensure the validity of action research, researchers have to adhere to principles that ensure the research quality (Dosemagen & Schwalbach, 2019).

The validity of the action research conducted in Poland, Lithuania, Finland and Austria is guaranteed by the quality of its organisation. The common goals of this research and the aims of the first cycle were discussed and elaborated on in the joint meeting. The aims of the second cycle of action research emerged after reflections on the first cycle by the teams of each country and were discussed in the joint meeting of all the countries. The aims of the third cycle were based on the reflections of the second cycle and were discussed in by analogy, ensuring a clear and precise definition. The validity of research methods and procedures was ensured by the responsibility for their design, assumed by university researchers, active discussions with teachers in the research process and from analysing and reflecting on the data.

As stated, a participatory and collaborative approach to the research was followed at all stages. Continuous reflection was held at different action research stages, allowing for all the participants to engage in the action research.

The use of UDL's theoretical approach for introducing changes to inclusive education practices ensured a connection between theory and practice. The teachers devised plans for UDL-based lessons and, during the course of their implementation, the impact on students' participation in the lessons was observed, their choices of learning that were convenient to them, expressing the qualities of the expert learner and having an influence on student achievement. It was also observed and reflected on whether action research helps in coping with challenges encountered by schools and whether or not it provides any benefit to all the participants in the process of teaching and learning. All this created pre-requisites for re-interpretation of the very UDL approach from the perspective of its application in different socio-educational contexts for different purposes.

Limitations of Action Research   The results of action research are context-specific and, therefore, cannot be generalised (Dosemagen & Schwalbach, 2019, 162). The results of one study cannot be applied when making predictions or conclusions about other groups. On the other hand, the processes of action research disclose how considerable changes can be modelled and implemented in different local contexts, how transformative social learning occurs when dialogue based, creative methods that change practice are applied. Action research encourages teachers' engagement in solving complex problems in the local context. Moreover, according to Bradbury et al. (2019, 27): "action research liberates learning from a consolation of facts to taking our own experience seriously".

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Chapter 4
Traditional Teaching–Learning Process in the Class of Polish School Through Lens of UDL Approach

Jolanta Baran ⓘ**, Tamara Cierpiałowska** ⓘ**, and Ewa Dyduch** ⓘ

Abstract Education researchers have long advocated modifications to the teaching–learning process in order to make the school a more inclusive space and conducive to individual and group development of students with diverse (including special) educational needs. This is to develop competences, skills and values that will allow students to better prepare for adult life in a rapidly changing world. This demand is not new and is not only a demand but refers to reforming the education process. In Poland, for many years the schools have been undergoing dynamic changes in many different dimensions, partly because of facilitating students with special needs. In the considerations of education researchers, as well as in the daily educational practice of teachers, the question arises as to what should be done to optimise the teaching–learning process and how. One possible idea for such optimisation is to implement the Universal Design for Learning (UDL) approach. The purpose of this chapter is to seek an answer to the question of to what extent the reality of the Polish schools corresponds to the principles of the UDL. An analysis of the traditional learning process through the UDL lens has identified those areas in which UDL approach solutions are provided and also where it is worthwhile to implement them.

Keywords Traditional teaching · Integrated education · Inclusive education · Universal design for learning · Teaching–learning process

J. Baran (✉) · T. Cierpiałowska · E. Dyduch
Pedagogical University of Krakow, Krakow, Poland
e-mail: Jolanta.Baran@up.krakow.pl; tamara.cierpialowska@up.krakow.pl;
ewa.dyduch@up.krakow.pl

4.1 Introduction: Realities and Challenges of Contemporary School Education in Poland

Inclusion as a promoted system of education is not yet fully implemented in Poland. The Ministry of Education is working on a project to transform existing education into inclusive education, which is still scheduled for public consultation. During the process of transforming conventional Polish education into inclusive education, the intermediate link has become integrated education.[1] Such a form was developed and implemented over the last two decades. Despite some benefits, many researchers have indicated that it did not work as effectively as it was supposed to, neither for students with special educational needs nor for those without such requirements (e.g., Gajdzica, 2014; Janiszewska-Nieścioruk, 2009; Parys, 2007).

From the segregated model (separate schools and other teaching methods for students with disabilities) which dominated to the end of the 1990s, through integrated teaching (common classes available for small groups of students with disabilities in each), we are now entering the era of the inclusive school. This is not just about integrating pupils with special needs into public schools, but about understanding that every student is different, everyone has their own difficulties and limitations (which can have very different sources) and above all, that everyone has their own potential, which is worth focusing on and which can be developed.

What we observe today is that the concept of pupils with special educational needs is also changing. It is no longer just students with disabilities, chronic diseases or the most talent; many other different factors are identified that may cause the modern student to present needs that require an individual approach from the teacher on a permanent or temporary basis. The variety of students with special education needs (SEN) comes from social changes and migration.

Inclusion is meant as a three-level process (Gajdzica, 2019, 32; Szumski, 2019):

– Open social environment—inclusion, providing people with special educational needs (including disabilities) with an opportunity to implement developmental tasks, function in a larger community and feel a sense of belonging.
– The strategy of the education system—educational inclusion, providing children/students with special educational needs with access to mainstream kindergartens/schools and local educational institutions, taking into account an environment that is individually adapted and minimally restrictive for the development of a student with disabilities. The main categories that construct the educational inclusion strategy are diversity, equality of access, equity, school for all,

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[1] This is one of three available forms of education for children with SEN in Poland. In integrated education, it is essential that the teaching and upbringing process is properly organised. Integrated classes are set up for children/students with certified special education needs in public kindergartens/schools/settings. Integrated classes are less numerous, attended by a maximum of 15 students without disabilities and a maximum of five students with special educational needs and/or disabilities. There are two teachers in an integrated class during the lesson, with a so-called leading teacher and supporting teacher.

a universal (common) curriculum, balanced learning objectives, taking into account the harmonious development of students, a flexible support system for professionals working together and an inclusive school culture. Participants in the inclusion process are: students with special needs, parents/guardians, teachers, other professionals and peer and local communities. Inclusive education should ensure that all participants in this process are provided with a favourable environment.

– Educational impact—inclusive education understood as a process of joint education of students with special development and educational needs with their peers, ensuring a sense of belonging to the local community and providing the necessary support (technical, methodical, psychosocial, organisational) resulting from special educational needs. The key to an inclusive approach should be to differentiate teaching content and methods according to the student's needs, which is the essence of respecting individual differences.

The very important issue in transforming school into a new school—for example, into an inclusive school in Poland—is remodelling the traditional didactics. As the Universal Design for Learning (UDL) approach is perceived as one of these that might support transformation (Szumski, 2019), it is worth analysing the weaknesses and strengths of teachers' practice and routines through the lens of the UDL approach for identifying the phenomena that need change (see Table 1.1 in Chap. 1).

The didactics textbooks emphasise that education is inextricably linked to the training process while education is 'teaching and learning ... with the accompanying bringing-up activities' (Półturzycki, 2014, 26). The teaching process is defined as 'the totality of conscious, planned and systematic didactic and educational impacts on pupils ... to provide them (students) with an education' (Kupisiewicz & Kupisiewicz, 2009, 87).

In the teaching process, the teacher is assigned a leading role. They carry out planned and systematic work with students and its effect, in the traditional sense, is to 'master the messages, skills and habits recommended by the curriculum' (Kupisiewicz & Kupisiewicz, 2009, 110). In a more contemporary approach, however, it is emphasised that the aim of teaching should be to develop learning skills (Jastrzębska, 2011), hence the aim of any teacher's activities is not so much to convey knowledge but to support students in the learning process in organising and facilitating learning for pupils (Półturzycki, 2014), including self-discovery of knowledge and even the construction of knowledge (Klus-Stańska, 2019).

It is considered that the most effective education method is, therefore, an eclectic method, activating all the senses of the learners, as well as requiring them to combine the previously acquired knowledge with new content and experience in solving a particular case or problem (Silberman, 2005). Such conditions, due to the diverse students, meet the UDL approach, as was already mentioned. It is also important to take into account the students' learning styles (Silberman, 2005).

Emphasis is placed, therefore, on the importance of not only preparing teachers for the profession but also the teacher's continuous work on her or himself. It is

crucial to constantly develop their pedagogical, didactic, methodological and communication competences.

The second process of education, that is learning, is directly related to the students: 'It is a process in which, on the basis of experience, cognition and exercise, new forms of behaviour and action are created or the forms previously acquired change' (Okoń, 2004, 433; Półturzycki, 2014; Kupisiewicz & Kupisiewicz, 2009). Learning is the process of 'intentionally acquiring certain messages, skills and habits, taking place in the course of direct and/or indirect knowledge of reality' (Kupisiewicz & Kupisiewicz, 2009, 184). The drivers of this process are primarily the student's own activity and strong internal motivation (Okoń, 2004). Teaching and learning processes are inextricably linked, and each of them has its own indisputable importance. What matters, however, is how they are distributed. Cooperation is strongly involved in these processes and becomes a prerequisite for the students' success. When a teacher interacts with students, both school actors perform similar roles (Kujawiński, 2010):

– A planner, for example, during the co-planning of a class programme of school and out-of-school activities for students
– An evaluator, for example, when co-evaluating student performance
– An observer, for example, while co-persuasive with each other in the joint performance of complex problem tasks
– An advisor, for example, when co-counselling each other on the selection and use of sources of information
– A helper, for example, when helping each other to understand something very difficult or ambiguous
– A researcher, for example, in the course of co-examining a natural, social or other phenomenon
– A creator/wizard, such as when co-creating ideas to solve open problem tasks or other difficulties
– An implementer, for example, when co-executing complex problem tasks
– An initiator, for example, when co-initiating some important teaching, educational or caring activities

Thus, the roles performed by the teacher and the student are balanced in the teaching–learning situations, regardless of the differently computed responsibility of each of them. The UDL approach respects such roles and helps in their development (see Chap. 1).

4.2   Methodological Assumptions on Teaching–Learning Process Analysis Through the Lens of UDL Implementation

According to the definition of the research subject it is 'everything that represents the so-called social reality, that is, communities and social collections, social institutions, social processes and phenomena' (Sztumski, 1995, 7). Following this approach, the subject of the research presented here was one class (at the beginning of the research in the school year 2018/2019 it was elementary school Class V) consisting of 17 students (including some students with SEN) and a team of four teachers in this class. The aim was to simultaneously capture the process of teaching–learning taking place in the examined community, as school education is understood as an interactive relationship between two simultaneous subprocesses: teaching (teacher activity and reflectiveness) and learning (student activity and reflectiveness). Thus, the main focus of the researchers was to examine the teaching–learning process in the researched class when comparing to the main characteristics of the UDL approach (see Table 1.1 in Chap. 1). The results were needed for identifying the educational conditions for implementing the UDL approach in that class in the best possible way. It was also clear to the researchers that such aims need to include a few steps: identifying barriers and conditions conducive to innovation in the learning process, that is by familiarising and proposing to teachers the implementation of the UDL approach and supporting them in implementing innovation to optimise the teaching–learning process in the diverse class team.

We have found the UDL approach to be an excellent way to make a difference in the learning process and to take a step towards inclusive education, since the basic principles of this approach provide an opportunity to organise high-quality, inclusive education that meets the diverse needs of all students. These principles include (Meyer et al., 2014):

– Providing multiple means of commitment
– Providing multiple means of representation
– Providing multiple means of action and expression

The research questions for the research were formulated as follows:

– What does the teaching–learning process look like in the researched class when comparing to the main characteristics of the UDL approach?

The above question was specified further with the use of the UDL approach characteristics:

– How do teachers and students perceive students' diversity in the classroom and what does that mean to them?
– How do teachers differentiate the learning environment (methods, sources of knowledge, educational resources) so that students can achieve their lesson goals?

– How do teachers and students perceive collaboration and what does that mean to them?

  Further, the second main question was added:

– What are the barriers vs. conditions that might support transformation of the teaching–learning process in the class through implementation of the UDL approach?

The research was carried out using the mixed method approach with the emphasis on the action research method (Szymańska et al., 2018; Szymańska, 2018; Czerepaniak-Walczak, 2014; Pilch & Bauman, 2010; Sagor, 2008). This methodology made it possible to blur the boundary between theory and practice, as action research 'is a systematic collection of information about phenomena that cause some changes, with the researcher being an inspirer and active participant of events. Research in action is carried out when one sees the possibility of changing a situation for the better, prepares a project to improve it, puts it into practice and observes what resulted from all this' (Pilch & Bauman, 2010, 307). An unquestionable advantage of action research is the fact that its informal character makes it possible to improve the pedagogue's workshop and serve to improve educational and teaching practice (Pilch & Bauman, 2010; Czerepaniak-Walczak, 2014).

The framework of the research process was designed in reference to action research cycles and covered:

1. The research issues (mentioned as of yet)
2. Action plan:

   – Try to convince teachers and students to implement changes, for example, to change the place of individual students and the teacher's position in the classroom during work (moving away from whole-class teaching to promoting cooperation between students).
   – Familiarize teachers with the principles of the UDL and show examples; there were concerns about how to implement UDL in the classroom at the basic level.

3. Synthetic description of the actions taken in this cycle:

– Suggestions to teachers on how to give choices to students and arrange teamwork in a different classroom space.
– Passing the floor to the students/activating students' initiatives through:

  – joint design of an ideal classroom space
  – making students reflect on their expectations towards the teaching/learning process (free talk about: What would be the ideal lesson you would like to take part in?)

– Offer students self-diagnosis for their learning process to recognize their own learning style
– Suggestions for teachers on how to differentiate between teaching and learning activities, taking into account different learning styles

For data collection, the following techniques and tools were used:

– Survey of teachers, students and their parents based on a questionnaire, which is a compilation of tools by Markowska & Szafraniec (1980), Sendyk (2001) and Zamkowska (2009).
– Participant observation of the activities of teachers and students during the selected lessons.
– Interviews with students on the following topic: What would be the ideal lesson you would like to take part in?
– Focus group interview with students—discussion to help students recognize their own learning style and ability to choose effective learning strategies.
– Focus group interview with teachers about the values of the UDL and their implementation options in their own educational practice and suggestions for teachers on how to differentiate activities (choice of purpose, working method(s), didactic means, forms of work) in the teaching–learning process, taking into account different learning styles of students.

The constant comparative method was used to analyse the content of interviews and both quantitative and qualitative data collected by surveys (Creswell, 2013). The constant comparative method was applied to identify topics and their specific threads in the data obtained through the research process, which were previously transcribed and encoded.

The *UDL lens* (see Table 1.1 in Chap. 1) was also adopted for analysis of the results, so some specific phenomena were recognised while work was done on the data collected. The main attention was driven to:

– Teachers' and students' perception of diversity in the classroom and the origins of educational difficulties
– Differentiation of learning environment (methods, sources of knowledge, educational resources) by teachers for achieving the lesson goals by students
– The experience of students–students and teacher–students collaboration
– Barriers versus strengths that might support transformation of the teaching–learning process in the class through implementation of the UDL approach towards inclusive education
– Students' attitude to the school and their duties

In order to ensure the accuracy and reliability of the analyses presented below, a communicative validation procedure was applied (Szmidt & Modrzejewska-Świgulska, 2015). It consists in presenting the subjects and threads selected in the analysis process and reconciliation of the interpretations made with them.

As previously mentioned, the research covered one class of a public elementary school with integrated settings in a large Polish city with the population exceeding 750,000 inhabitants. At the start of the research project, that is in December of the school year 2018/2019, it was Class V of an integrated form; the students were then 11–12 years old. The research took place just over one semester, that is until the end of the school year.

The class team representing the object of the research is—in accordance with the educational law in force in Poland—the integrated form (Dyduch, 2012; Dziennik Ustaw, 2015, poz. 1113; Szumski, 2006). Several students in this class have special educational needs assessment, which means that these students have a disability of some kind or learning disorders. Other students do not have such documents, but this does not mean that they do not have different/diverse educational and developmental needs, including special ones. To define them, the strengths and weaknesses of each student in the class were also identified.

For the sake of ethical standards of the research process, it is important to emphasise that prior to the project's start, parents were asked to give written permission for their child to participate in the research, including recording interviews with students and observing their actions during lessons. The aim of ensuring high ethical standards in the research was also to ensure the anonymity of the persons surveyed, by means of confidentiality of the so-called sensitive data. While interviewing students, the principle of voluntary participation was applied each time.

The community of active researchers consisted of four teachers of the studied class, including three leading subject lessons and one assistant, who accompanied the students during most of the lessons, as well as three researchers from the Institute of Special Needs Education at the Pedagogical University of Kraków. This enabled the triangulation of empirical data (Kubinowski, 2010).

4.3 Teaching–Learning Process in an Integrated Class: Analysis of Teachers' and Students' Roles and Activities Through the Lens of the UDL Approach

To develop good conditions for UDL approach implementation in the selected class, it was necessary to identify the main characteristics of the teaching–learning process in which the teachers and students were involved so far. In this way, further research was planned that was meant to support the strategy to incentivise teachers and students to change their routine activities in the teaching–learning process. To make a proper identification of teachers' resources feasible, their beliefs and professional experience, as well as gaining knowledge about students, were supposed to enable the choice of strategy and adaptation of researchers' communication with the teachers, and ultimately to develop a plan for researchers' visits to the school and to negotiate the goals of the teachers themselves. The data collected were structured and prepared to present the main characteristics of the use of the UDL approach (*UDL lens*) and the specified research questions.

Teachers' and Students' Perception of Diversity in the Classroom and the Origins of Educational Difficulties

A prerequisite for the implementation of the teaching–learning process in accordance with the UDL approach is a good knowledge of the students. The analysis shows that teachers know their students well and easily identify their strengths and weaknesses. They provided detailed information about students. When characterizing students with SEN, a specific term was usually given about the disorder they were diagnosed with, such as Asperger syndrome, dyslexia, aphasia, etc. What is more, at least one positive and negative trait has been assigned to each student. The least positive qualities were given to three pupils (only one for each of them), that is *he/she is willing to go to school* or *she/he is polite*. Even in positive qualities, the following, for example, were mentioned about students: *often distracted*, *in class she/he takes care of other things*, *often loses work cards*, *with low self-activity*. This also draws attention to the fact that the teachers' descriptions of the functioning of the students were dominated by their weaknesses.

Students also showed their own reflections on the grades in the teaching–learning process. Sometimes the maturity of the students seemed surprising, as they perceived well the inner diversity of the class teams.

> Beata: *The grade should perform the function showing the student how he is doing with a particular lesson. It's important that the evaluation criteria are adapted to children. Well, you know, some people have their medical certificates, others, so ... Some are visualizers, others have kinaesthetic skills, and still others are auditory learners. Everybody is different. So everything has to be adjusted.* (Reflection with researcher, 1)

Taking into account the diversity of students is the main determinant of the learning activities of the teachers surveyed. Such a picture emerges from the interpretation of detailed answers to questions in the survey about the teaching strategies used. Keeping in mind, the diverse possibilities of pupils, the teachers, above all, clearly individualise the requirements and the way in which knowledge is communicated. They also admit that they rarely take students' interests into account. On the other hand, they individualise the choice of teaching aids for some students according to their abilities. In teacher planning, thinking about students' weaknesses rather than their strengths prevails.

Based on the data collected, one can get the impression that student diversity in the classroom is a challenge that forces teachers, above all, to differentiate expectations and adapt the way they communicate with each student during the lesson. The most common form of teacher action in educational interaction is individualised command simplification.

In teacher perception and activities, the diversity of students divides the team into those who need a different approach (individualisation) and those with whom they can work as a whole/team because of lack of, or rather small, differences.

A good orientation in the strengths and weaknesses of students does not entail a change in the way they think about the sources of their educational difficulties. The subjects consider the causes of educational difficulties within the student with

special needs. It is worth noting that both teachers and students in the course of interactions activate various ways of supporting them so that their student/colleague does not experience difficulties due to their differences.

Differentiating Learning Environment (Methods, Sources of Knowledge, Educational Resources) by Teachers for Achieving the Lesson Goals by Students

The survey found (see Table 4.1) that teachers develop their students' knowledge and competences by mainly using traditional methods in the teaching–learning process. However, in a view of the diversity of pupils, they apply, first of all, *additional instructions* and, as has already been mentioned, *simplifying the instructions*. They then consider the need to *explain incomprehensible terms/words* and to give *short and precise guidance* to the student to help them to be active/to perform tasks. For selected students, they *increase the time of exposure and on a specific activity*. They find that, uncommonly, they have the opportunity to *combine theory with practice*.

The assessment of the specific educational strategies mentioned by teachers from the UDL approach perspective leads to the conclusion that teachers apply some of the UDL principles in the teaching process, although without being aware that their chosen activities fall within this concept. However, it should be made clear that they rarely plan and implement solutions that promote the achievement of objectives in

Table 4.1 Strategies used by each teacher by percentage

Answers/items	Teacher and percentage of strategy use			
	Teacher Agnes (%)	Teacher Bella (%)	Teacher Cecil (%)	Teacher Dalia (%)
Delivering the multi-sensory experiencing of objects	0	0	30	72
Offering tasks to the best of the student's ability (student copes with tasks)	18	48	48	30
Adapting activity to the student's interests	0	6	18	12
Creating opportunities to choose exercises	0	12	12	6
Teaching theory in conjunction with practice	18	30	36	60
Working using materials/objects	48	0	18	18
Providing short and precise guidance	54	42	60	54
Explaining incomprehensible words	48	36	60	60
Simplifying or adopting commands/tasks	42	42	66	36
Providing additional instructions	54	54	54	30
Extending the time of item exposure	12	24	24	12

The gray is for UDL strategies

ways that go beyond the typical/traditional approach. Teachers, therefore, sometimes consider the students' individual learning style, strengths/skills and their interests and adapt the proposed activities to them and organize situations enabling students to choose an exercise or task. It also happens that in addition to the typical materials and help that teachers use to implement the subject of the lesson, they introduce additional materials and aids. They also refer to the presentation of the purpose of the lesson to give examples of the use of learned knowledge in practice. Creating situations in which students seek knowledge or alternative solutions on their own is notable because teachers say they lack time to do so. However, it is possible as a voluntary activity or additional homework.

The analysis of the percentages of teachers' strategies shows that traditional teaching dominates their activities (black letters). Strategies that can be classified as the UDL approach (gray letters) are much less represented. They are least likely to be used by Teacher Agnes and slightly more often by Teacher Bella. *Delivering the multi-sensor experiencing of objects*, on the other hand, is very often used by Teacher Dalia.

Before the interview, the researchers held classes with students to help them recognise their own style of learning and to introduce students to self-diagnosis for learning. The students quickly drew practical lessons from this knowledge. One of the students (as quoted above), when speaking about the 'ideal lesson', referred to this issue and outlined what should take place in such a lesson:

Beata: *There should be a lot of inscriptions in particular. The teacher should write a lot on the board or display inscriptions on the screen, just for the visualisers. Besides, the teacher should speak a lot, speak a lot and clearly, for the auditory learners because they listen. But there should also be something there that, let's say, two minutes exercises, for those kinaesthetic learners to walk around the classroom. And that would be such a perfect lesson. That's exactly what I'd like. We'd do a lot, too, but material must be adapted to the kids.* (Reflection with researcher, 1)

In order to recognise how students think about their own educational situation and how teachers work with them, students were interviewed (individually, in dyad, as well as in a single triad, depending on the students' wishes). The interview opening question was as follows: What should the lesson you would like to attend look like?

Meanwhile, the auxiliary, detailed question, asked when students needed additional questions, was: How would a superb classroom look, where you and your colleagues would feel good, where you would learn well?

It turned out that numerous students had no ideas at all. An example of having no idea is shown in the statement given below:

Adam: *I do not know. Hard to say so. I have no idea*. (Reflection with researcher, 11)

When thinking about the ideal classroom space, some students presented a belief that the status quo is good (and even that it is the best and only possible option) and therefore saw no need for any change:

Cela: *In the first form, we were sitting in such a half circle, but not any longer. Definitely the best idea, it's like now, in such rows, sitting on benches set up in such rows opposite the board. This is the best idea. This is definitely the best layout*. (Reflection with researcher, 3)

Beata: *As it is, it suits me.* (Reflection with researcher, 1)

Dorota: *It wouldn't have worked otherwise*. (Reflection with researcher, 4)

A large part of the students' statements was concerned with their preferred colors:

Cela: *I wish the walls were red.* (Reflection with researcher, 2)

Edyta: *I wish the classroom was more colourful and brighter. I like pastel colours.* (Reflection with researcher, 5)

Some students had ideas, but they quickly perceived the problems involved:

Flora: *It'd be fun to sit in the armchairs, I'm sure. But it would be hard for children to focus on learning. ... Puffs would be nice, but I don't know whether they would be conducive to learning.* (Reflection with researcher, 9)

Some students shared ideas, not so much about the ideal space of their own classroom, but more broadly, about the school space and the area surrounding the school. All this, however, under the proviso that 'I do not think it will work' or 'but I don't think it's possible'.

Dorota: *A mini-bar should be at school. It would be cool to have more modern class. But that's rather impossible*. (Reflection with researcher, 4)

Flora: *There (next to the school) there are lanes, a mini park could be made here so that you could calm down there during the break between classes. But that would probably hard to implement*. (Reflection with researcher, 9)

The ideal classroom was not only about space, but above all about undertaking valuable activities, including those of a charitable nature.

Dorota: *To enable our school to participate in such operations, for instance for the shelters, or to bring aid to the poor*. (Reflection with researcher, 4)

Flora: *For instance, you can arrange team-building evenings with the classmates. At that school where I was previously, our Polish language teacher had organised such literary evenings every two weeks. We would read poems and then some snacks were served.* (Reflection with researcher, 9)

The picture of an ideal classroom space emerging from interviews with students leads to the reflection that many students perceived as ideal the typical school class they knew and were used to. The following statement can be used as an example here:

Beata: *First of all, this classroom be decorated with various drawings of children hanging here. And this classroom should be varied a great deal. And in general, there should be such equipment for various classes—for mathematics, there should be large triangles; in the geographical classroom, I would like to have different maps, and in general, and on the walls, I would like to have maps so that children could take a closer look. It's already partly there. And that's it. It seems to that it should look like as it is now*. (Reflection with researcher, 1)

The analysis of the narrations obtained in the course of the interviews with students in relation to the main question leads to the conclusion that they were not able to imagine lessons other than those in which they had participated so far. This

attachment to the school routine can be exemplified by a statement by one of the students about the 'ideal lesson' of geography he would like to design:

> Cela: *At the beginning, the teacher should say 'Today we'll have class on this and that topic' and the students should say 'Oh, that's cool'. Then we will write the topic of the lesson on a blackboard, then we open atlases and maps, and look for a city, and what country it is located in. ... I would say to the students 'open the textbooks please' on page such and such and they would read there. ... At the end of the lesson I would check the presence on a piece of paper. ... I would ask students to do some homework, for example, from exercise book, also from a textbook, and also from a notebook.* (Reflection with researcher, 2)

To the researcher's question: What else could you bring to such a perfect lesson to make it even cooler? The student continued the description of the ideal lesson and gave the answer:

> Cela: *You could still bring your notebook.* (Reflection with researcher, 2)

When asked how students' knowledge could be tested during an ideal class, a girl said:

> Gosia: *The students should answer the teacher's questions.* (Reflection with the researcher, 7)

It should be noted that during this interview, the researcher repeatedly stressed that it is supposed to be an idea for a lesson in which the student would be willing to participate, and that he or she could conceptualise and design it in the way that he or she thought it would be the most interesting, the coolest and without any limitations; that the student could decide for him or herself what the ideal lesson could look like.

Some students revealed their own ideas about how to change the teaching–learning process, but at the same time they also pointed out various problems associated with the implementation of these ideas:

> Adam: *During physical education classes one person could come up with what kind of exercises we do today, and during next physical education class another person could suggest exercises. But during such classes, it's impossible.* (Reflection with researcher, 11)
>
> Flora: *It would be nice if there were different school trips related to every subject taught at school, but the teachers say that we wouldn't be able to learn the whole curriculum then.* (Reflection with researcher, 9)

Even when researchers presented students with proposals/opportunities for more flexible and creative ways of teaching, some students clearly showed reluctance or even criticism towards such proposals.

The researcher tries to imagine such a situation in history classes. For instance, your teacher comes in and says the following: 'Today we will talk about the sixteenth century. We have discussed the basic, crucial issues together, and now each of you can pick up an issue dating back to the sixteenth century that interests you. Not everybody has to learn the same thing at the same time. Perhaps somebody's interested in, let's say, wars that were waged then. And someone else may be interested, for example, in the arts prevailing in that period. What do you think about it?'

> Beata: *It seems to me that… No! I think it is a bad idea, because then the knowledge would be fragmented and all... And some would know it and others wouldn't know it, but they*

would know something else. Again, those guys don't have knowledge possessed by these guys. The knowledge would be fragmented. It would not be a good idea! (Reflection with researcher, 1)

Teachers use traditional teaching methods. Knowledge is passed on ('given'); even if problematic methods are used, the teacher is the person who directs the search for knowledge in an authoritarian way, imposing ways of seeking knowledge, controlling this process. They rarely encourage students to look for alternative solutions.

From the teachers' survey statements, a picture emerges of the dominant and therefore traditional role of the teacher in the teaching–learning process. Unbalanced educational interaction comes to the fore. At each stage of the lesson, the teacher usually assumes a role that directs and controls the learning process of the students. Students ask problem questions that the teacher answers, but they rarely use these situations to encourage the student to act independently or to create a situation conducive to the student undertaking independent cognitive work in order to gain experience that allows him or her to become an expert in some chosen field of knowledge or activity. Such actions are shifted to extracurricular activities, for example, informal after-school activities—so called teams for developing students' interests.

As has already been demonstrated, the teachers' survey provided data on the application of combining theory and practice in the teaching process (see Table 4.1). Teachers' responses and students' statements revealed that even if teachers try to implement this teaching strategy, it takes place rather in the initial phase of the lesson as an indication or example of the possibility of applying specific knowledge in a specific situation or conditions, having to do with presenting the purpose of the lesson to the students. Occasionally, certain content or action refers to a specific human activity, and thus illustrates contextually the application of knowledge in practice during the implementation of the subject of the lesson.

The Experience of Students–Students and Teacher–Students Collaboration

An important or perhaps key aspect of the teaching–learning process that appears in the students' statements is cooperation during the lesson, which is not only perceived as an important but also a difficult area to implement:

Hubert: *It would be good to cooperate, but some people can't cooperate. Cooperation is really tough in our class. We could have, for instance, the following arrangement: on Monday someone sits with someone, on Tuesday someone else sits with someone else, and if someone wants to, he sits alone. But some people don't want to.* (Reflection with researcher, 6)

The researchers also raised the issue of the roles of the teacher and the students during the teaching–learning process. Students were strongly of the opinion that the leading role in the teaching–learning process belongs to the teacher.

Beata: *I think it's best if the teacher teaches. The best thing to do is for the teacher to teach.* (Reflection with researcher, 1)

Students who are encouraged to reflect on how to reduce their teacher's leadership role, while enhancing their commitment and own activity in the learning process were not able to break away from the routine based on their own school experience. Encouraged by the researchers to reflect on how this can be changed, students made proposals that demonstrated the high rigidity of their own thinking on the subject:

Beata: *It could be that your teacher says: now read pages 44 and 45 from the textbook and the children will learn the content themselves. Then the teacher will say that there is a chapter that we have to read about something. She will give us start page and end page numbers, and children can learn in this way. They can just (read) from the textbook. They'll do the exercises.* (Reflection with researcher, 1)

In their statements about the ideal lesson, the students also outlined the profile of the ideal teacher:

Flora: *He/she should be cool for sure. And it's nice when we have such a friendly relationship with the teacher. Because there's always something to say.* (Reflection with researcher, 9)

Cela: *The teacher should speak in a pleasant voice and not shout.* (Reflection with researcher, 2)

Flora: *It would be good if always the teacher, not because it is his duty … should give the floor to the student. However, the students should be told not to make pranks or something, but instead to say something wise.* (Reflection with researcher, 9)

The students' and teachers' opinions about cooperation refer to their experience and thinking about the traditional teaching–learning process. They show that student–student cooperation is perceived as conditional and based on individual peer relationships and so-called 'likes and dislikes' of others. However, teacher–student cooperation is being built on the teacher's authority, on her/his good personal characteristics and on traditional perception of professional role by students. These facts could be interpreted as barriers to inclusive education. The transformation of this traditional process of education might be achieved by UDL approach implementation.

Barriers vs. Strengths that Might Support Transformation of the Teaching–Learning Process in the Class Through Implementation of the UDL Approach Towards Inclusive Education

During the first steps of the project, a meeting (recorded with the consent of the participants) was organised to familiarise teachers with the UDL approach and gather their opinions on it, as well as to discuss with them their daily work at school, including their preferred teaching style. The teachers seemed rather unconvinced

and distrustful of proposed changes as they were accustomed to their teaching strategies. They listed the formal difficulties and, in their view, objective barriers that would prevent change. The analysis of the recorded interview with the teachers confirmed the expected barriers. The barriers included primarily: *barriers inherent in the education system, which are mainly related to official documents and regulations concerning education and teachers' sense of involvement in control and management rigors.*

Teachers felt highly responsible for what knowledge their students have and how they are able to use this knowledge, and strongly prefer their own teaching style, which they have developed through years of professional experience.

Teacher Agnes: *There are certain conditions and we feel imprisoned by those conditions.* (Reflection with researcher, 14)

Teacher Bella: *I am a teacher who is not sick, I always work and have difficulties in implementing the curriculum to its full extent (the so-called 'core curriculum' established by the Ministry of National Education).* (Reflection with researcher, 15)

Barriers inherent in the teachers here are personal, related to their beliefs and professional experience. After a suggestion to give students a better chance of working in groups, some teachers found that group work makes the classroom noisy and loud, which gives the impression of chaos they do not like.

Teacher Agnes: *I'm annoyed by the noise*. (Reflection with researcher, 14)

Teacher Cecil: *The group was delighted and I was upset. I gave them assignments—there was chaos and noise*. (Reflection with researcher, 16)

Teacher Agnes: *It is not possible for every student to succeed in class. I won't hold a class like this in my life*. (Reflection with researcher, 14)

The discomfort caused by a change in the way students work with them made it difficult for teachers to accept that even temporary noise and apparent lack of order in the classroom does not have to last long and is an expression of creative action, leading to a failure to see the possible positive results associated with student activity and performance and the satisfaction of both students and teachers.

Students' Attitude to the School and Their Duties

The collected empirical data, that is students' statements from the surveys, were compared with those of their parents. None of the parents stated that their child did not like going to school while one of the students gave a categorically negative answer. Almost all students surveyed felt safe at school and all parents were fully convinced about this fact. When asked about the motivation and activity during lessons only few students remarked that they were used to being motivated and active. Most of them confessed that they were not very much engaged in learning at school. Almost half of them seemed to strongly prefer the art and physical education classes to maths, history or Polish language lessons.

Teachers' Professional Qualifications and Students' and Their Parents' Opinion on Them   The team of teachers involved in the research had very good professional qualifications and experience. They took care of their professional development and their knowledge. They took many courses that gave them practical guidance for teaching diverse groups of students, for example, therapy and education of children and adolescents with autism and Asperger's syndrome, education of students with hearing impairments and education of students with intellectual disability (see Table 4.2).

Apart from closed and semi-open questions, the survey forms also contained open ones. As part of the open questions, students were asked to describe their teachers. The terms they used most often concerned both personal and professional competences and were as follows: helpful in learning, kind, patient, good, trustworthy, consistent, caring, cool, cheerful, kind and peaceful.

On the other hand, the parents emphasised the professional competence of the educators working with their children, saying: they understand the needs of the students, teach well, teach in an unconventional manner and deal well with conflicts and difficult behaviours of students. They not only listed both positive and negative

Table 4.2 The teachers' professional qualifications

Symbol	Total experience in teaching	Educational background (teaching training level)	Extra courses
Teacher Agnes	29 years	Pedagogical faculty, M.A.	Postgraduate studies in education of students with hearing impairments Qualification course in education of students with intellectual disability
Teacher Bella	15 years	M.Sc.	Post-graduate courses: IT applications Pedagogical course Qualification course in studies in education of students with hearing impairments and with intellectual disability Numerous courses on working with autistic spectrum students
Teacher Cecil	22 years	M.A.	Postgraduate courses: therapy and education of children and adolescents with autism and Asperger's syndrome, qualification course in education of students with hearing impairments and with intellectual disability Argumentative and alternative communication—conference, numerous courses, safety training (drugs, aggression, cyberbullying), student motivation
Teacher Dalia	2 years	B.A. M.A.	Postgraduate studies therapy and education of children and young people with autism and Asperger's syndrome Courses on working with dyslexic students, preventing peer violence and conflict resolution

personal traits concerning a particular teacher but also generalised them, saying: nice, wise, have a sense of humour, demonstrate peacefulness, patience, perseverance, show fair treatment, demanding, one of them shouts at the students and one does not express his opinion. The statements of both students and parents are consistent in assessing the students' positive affection for all their teachers.

4.4 Discussion and Conclusions: What Is Worth Doing

The presented results reflected using the UDL approach lenses indicated some important barriers for transformations towards inclusive education (see Fig. 4.1). The first one was called *teachers' and students' perception of diversity in the classroom and the origins of educational difficulties* and was highlighted by showing the way the teachers worked with students at different levels of functioning. The research was started with a survey, whose findings indicated that students from the class were a team that varied in terms of individual and special educational needs, motivation and learning style, as well as manifested interests. They were also found to vary in terms of their motivation to learn, skills, learning styles and interests. It turned out that among them there were students with primarily artistic interests
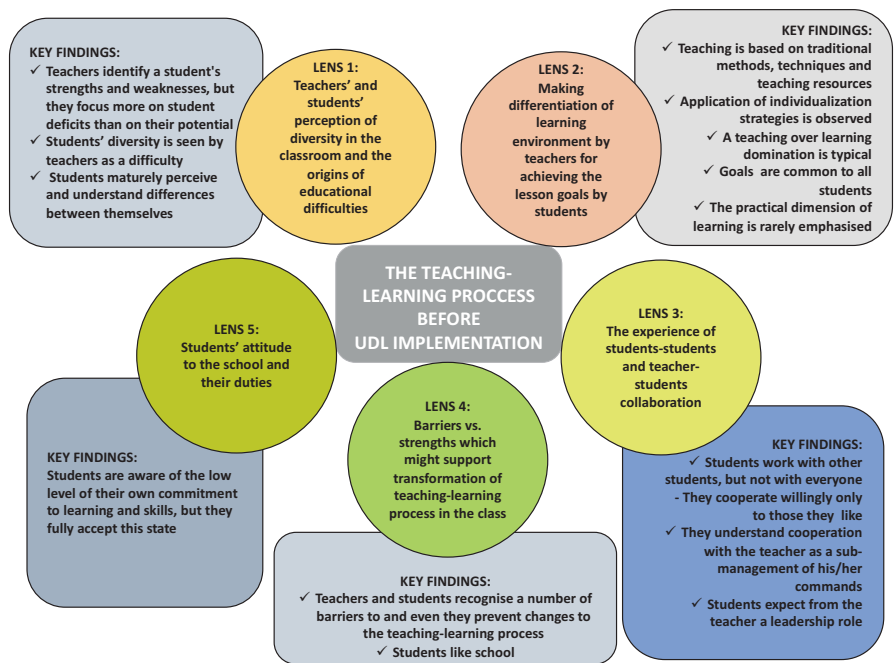
Fig. 4.1 Traditional teaching–learning process—analysis through lens of UDL

(music, art), whereas interests in history, information technology or geography were identified individually.

In casual talks and interviews with teachers and students it was found that teachers and students were reconciled with the current school environment, that is with conventional, routine teaching–learning. They felt safe in this environment. It can be considered that such a conservative approach is a result of the negative impact of reforms introduced every couple of years by the Ministry of National Education since the first profound change in the education system in 1999. Teachers also followed the cultural changes in the world and, being aware of the increasing pace of changes, seemed to be tired of the feeling of instability and the constant need to adapt to changes, which will either turn out to be bogus changes or will require new competences, knowledge updates, etc. (Knasiecka-Falbierska, 2013; Śliwerski, 2013). The students also disclosed that they were used to routine activities that gave them a feeling of comfort. When asked about their proposals for changes concerning teaching–learning and in school life, both of them expressed their reconciliation with the status quo and their concern about the changes proposed to them by researchers. Their statements also showed a lack of faith in the success of any change.

It could be that the pessimism shown by teachers and students is rather a fear of the need to develop new strategies for adaptation and emancipation through education, requiring personal development and demanding the application of new strategies in the teaching–learning process (Czerepaniak-Walczak, 2006).

The data collected made it possible to identify the factors inherent in the daily routines of teachers and the students' attitudes, whose permanency was considered to be important barrier to encourage UDL approach implementation and thus to initiate changes in the realities of the surveyed class. It was assumed that this was just a portion of various obstacles that occurred in making differentiation of learning environment (methods, sources of knowledge, educational resources) by teachers for achieving the lesson goals by students. In relation to the individual and special needs of students, the preliminary study interviewed teachers about the use and adaptation of methods while working with students. Their statements confirm the use of rather conventional teaching strategies and teachers not enough paying attention to the personalisation of students' work and the use of less conventional means and forms of activity. However, they consider the diversity of students and make an attempt to modify their procedures. Most often this is related to the provision of additional instructions/information and to the simplification of instructions. Meanwhile, the least frequent activities of students are those matched with their interests, in which they are offered opportunities to pick up exercises/tasks on their own. Thus, the survey showed that teachers used traditional and routine teaching strategies, although they tried to adapt them to the needs and capabilities of students. The most common of these strategies were the provision of additional instructions and information, and the simplification of instructions. The teaching and learning process, in this period of our action research, was characterised by a rather passive attitude of the students towards the leading teacher. In the interviews held with teachers and students in the class understudy, it was found that they tolerated and even fully accepted the existing school reality and such a teaching–learning

process. What is more, disbelief in the success of the proposed change involving the implementation of the UDL approach and even fear of it was recognised. This was related to the fear of losing the sense of security that is given by being in the familiar, predictable reality.

Thus, analyses of the collected results showed that both teachers and students were used to traditional, routine teaching–learning methods, felt fear of change, saw many barriers hindering the implementation of the UDL strategy and did not see the need to overcome them. Generally speaking, they did not perceive the need for change, nor thought it made sense.

The experience of students–students and teacher–students collaboration shown in the data leads to the conclusion that there is a need to give students more chance for collaboration in changing groups, to widen their peer relations experience by working with diverse colleagues to learn from each other and for improving cooperation by varied educational and social experience in the classroom. This is because students prefer and choose collaboration only with some peers; they do not want to change groups. They also expect from teachers to take the leading position in the teaching–learning process, making them less self-directed and less aware of their personal goals for their education.

As for recognising *barriers* vs. *strengths that might support transformation of the teaching–learning process in the class through implementation of the UDL approach towards inclusive education* the data from interviews as well as from the survey were analysed. The formal barriers reflecting the system of education seemed very strong but some barriers inherent to personal beliefs and professional experience also appeared in teachers' opinions. Therefore, tools for changes towards inclusive education and UDL implementation might be seen in teachers' responsibility, their qualifications and their willingness to work for the students' success.

Further, the *students' attitude to the school and to their duties* seems promising and allows promoting changes by implementing UDL in the teaching–learning process in their daily school routines and might provide optimistic results for transformations into inclusive education.

Regardless of the fact that the vast majority of students felt safe at school and claimed that they liked attending it, more than half of them showed a reluctant attitude towards school duties. Students were shown to be aware of their learning styles and preferences, especially as regards the form of effort in class and its content.

Although students felt good at school and in the classroom, some of them were not motivated to learn, and most of them feared poor grades. This is evidenced by their statements, indicating their well-being at school, their individual preferences and learning opportunities, their interests and their attitude towards school duties. On the other hand, out of the four teachers surveyed, three of them had relatively long service and extensive professional experience; they admitted that the fact they had to answer questions posed to them led to a reflection that they do not know all students well enough and probably do not always apply appropriate educational strategies to them.

The research project revealed differences between the opinions of parents and students about the fact that the students themselves were positive about the school

and the school situation and their well-being at school. According to the parents, their children's attitude towards school was positive. However, slightly fewer students than their parents might think admitted that they liked school and teachers and felt safe at school. Most students felt that they had at least a few friends among their peers at school, although they admitted that it was often not possible to make arrangements with their classmates after school. These findings might be perceived as typical if we refer to many studies of Polish researchers on similar topics (see the report of Domagała-Zyśk, 2018 or Chrzanowska, 2019).

The attitude of teachers and students was made legitimate by the focus on various barriers, which in their opinion hampered or even prevented UDL approach implementation. Among them, the most frequently mentioned were the barriers inherent in the education system, which are mainly related to official documents and regulations concerning education, teachers' feeling of being entangled with control and management rigors and personal barriers related to their beliefs and teachers' professional experience.

The research project undertaken in the selected school and class was mainly aimed at recognising the barriers and challenges in promoting the application of the UDL approach and supporting teachers and students in this area in the trials of optimising the teaching–learning process in a diverse class team towards transformation for inclusive education. It has been assumed that observing and documenting the ongoing changes will convince all participants of the survey about the value of the UDL approach as a line of thinking and organising education in a manner that favours its transformation. These benefits consist in creating a learning environment that is universal enough to enable each student, regardless of their abilities and difficulties, to participate fully in it and to make it an engine for optimal development, both individually and for the group to which they belong. Moreover, the aim was to begin the transformation of the attitude of students from passive recipients of learning content into active learners and builders of their own knowledge, able to control, plan, organise and manage the process of their own learning, responsible, creative and able to solve various problems in cooperation with others. For teachers, on the other hand, the benefits are seen in the remodelling of their thinking and pedagogical activity under the influence of the changes observed in the students, that is the transfer from the traditionally understood role of a teacher towards one who becomes a moderator and facilitator, creating optimal conditions for the teaching–learning process in a diversified group of students. This change is possible, among other things, with the use of the UDL approach, as confirmed by available literature sources (Capp, 2017; Paiva de Oliveira et al., 2019; Scott, 2018). The results of our research seem to be a strong argument for directing and supporting the class towards the change.

Despite no need for change expressed by students and teachers, the more that teachers and students expressed their interest in continuing joint efforts and research activities, the more we were convinced, as researchers, that the implementation of the UDL solutions will offer students and teachers an excellent opportunity to modify their regular routines in the teaching and learning process. Such experience, in turn, will be conducive to the implementation of the principles of inclusive

education in the class under study, and then in the entire school. Moreover, we found it clear that the teachers showed awareness of the upcoming changes in the education system and its transformation towards inclusion.

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Chapter 5
Transformations of the Teaching–Learning Process Towards Inclusive Education as a Result of the UDL Approach Implementation

Jolanta Baran (ID)**, Tamara Cierpiałowska** (ID)**, and Ewa Dyduch** (ID)

Abstract This chapter discusses the assumptions, implementation and deliverables of an action research project in a selected Polish class of integrated form. The main objective of the project was to trigger changes in the learning–teaching process based on the Universal Design for Learning (UDL) approach and thus promote inclusive education. The action research lasted one school semester. The empirical data, mainly qualitative, triangulating various sources of information and synthesising perspectives, were used to identify specific topics and threads identified in the gathered inputs, to present it in an orchestrated manner and to interpret it. It has been indicated that UDL approach implementation has a positive impact on the course of the teaching–learning process and optimises it to enhance the activity, commitment, self-reliance and responsibility of students and develops their cooperation, which breeds inclusion in education. Meanwhile, it stimulates teachers to change their mindset with a view to the essence of success in education and supports their daily practice.

Keywords Transformation of education · Universal Design for Learning · Teaching–learning process · Inclusive education

J. Baran (✉) · T. Cierpiałowska · E. Dyduch
Pedagogical University of Krakow, Krakow, Poland
e-mail: Jolanta.Baran@up.krakow.pl; tamara.cierpialowska@up.krakow.pl;
ewa.dyduch@up.krakow.pl

5.1 Introduction: The Theoretical Background for Changes in the Teaching–Learning Process Through Implementing the UDL Approach in the Integrated Class in Poland

Inclusive education provides an opportunity to modernise the teaching process. However, it requires appropriate competences from teachers and opportunities for students to define their personal learning goals and their self-determination (EADSNE, 2011). In line with the key principles of improving the quality of education defined by EADSNE (2011), it is recommended that teachers use a constructivist approach in teaching and adequate solutions to make the course of lessons more flexible. Students are motivated to become active partners in the teaching–learning process and take on different roles related to cooperation with colleagues in heterogeneous teams.

The available studies confirm the effectiveness of promoting such solutions (Szumski, 2019; Mitchell, 2016). Moreover, some sources suggest strategies and approaches worth using to create favourable conditions for inclusive education, which includes the Universal Design for Learning (UDL) approach (Szumski, 2019; Baran, 2018; Mitchell, 2016; Olechowska, 2016).

Notwithstanding the inevitability of changing the education system in Poland, attention is drawn to the risk of maintaining the diversity of educational offered as a result of the emerging tendency to disapply the forms of education developed so far and to promote only one solution.

As a result of such an approach, one can see the 'programmatic and organizational unification' in education (Janiszewska-Nieścioruk & Zaorska, 2014, 24), and this phenomenon paradoxically denies reaping the benefits of student diversity, its inclusion and respect, as well as the use of different approaches in the teaching–learning process (Bąbka & Korzeniowska, 2020).

In the opinion of many practitioners and researchers, inclusive education is already being implemented in Poland and on the basis of this claim comparative studies are carried out concerning, for example, the achievements of pupils from public, integrated and inclusive education. In the published research reports, however, it is difficult to find a description of how this inclusive education looks like in practice, what methods are used, etc. (Domagała-Zyśk, 2018).

The question, therefore, arises as to whether the measurements, analyses and prognosis made actually describe the facts they intend to describe. Consideration should also be given to the extent to which comparing different classes from different schools that consider themselves inclusive may be appropriate, if there are many different methods of teaching and learning available and they might be used.

Another issue refers to the research (action research) on practice that is directed towards implementing innovation and maintaining the changes in the evolutionary process. Introducing a change in teachers' work is always an evolutionary task. According to Arends (1995), two well-established theoretical orientations give direction to research in the process of change in educational institutions, that is:

psychological, which takes into account people's reactions to change, and systems theory, which in our research is concerned not only with the analysis of the operational conditions of a particular school but also its status and place in the education system along with legal regulations. Moreover, it is known that the top–down implementation of reforms rarely brings sustainable and intended effects. This is the very important argument for success in transforming the practice of education.

The analysis of barriers identified through the UDL lens (see Fig. 4.1) presented in Chap. 4 becomes the starting point for the next cycle of action research of our project. This was aimed to promoting the application of the UDL approach and supporting teachers and students in this area with the aim of optimising the teaching–learning process in a diverse class team to change the education into inclusive education. It has been assumed that observing and documenting the ongoing changes will convince all participants of the survey about the value of the UDL approach as a line of thinking and organising education in a manner that favours its transformation. These benefits consist in creating a learning environment that is universal enough to enable each student, regardless of their abilities and difficulties, to participate fully in it and to make it a tool for optimal development, both individually and for the group to which they belong. Moreover, the aim was to transform the attitude of students from passive recipients of learning content into active learners, builders of their own knowledge, able to control, plan, organise and manage the process of their own learning, responsible, creative and able to solve various problems in cooperation with others. For teachers, on the other hand, the benefits might be seen in the remodelling of their thinking and pedagogical activity under the influence of the changes observed in the students, that is, the departure from the traditionally understood role of a teacher towards one who becomes a moderator and facilitator, creating optimal conditions for the teaching–learning process in a diversified group of students. This change is possible, among other things, thanks to the use of the UDL approach, as confirmed by available literature sources (Capp, 2017; Paiva de Oliveira et al., 2019; Scot, 2018), but also the results of our own research.

The main research problem was the essence of the change taking place in the teaching–learning process, so an answer was sought to the following question: How is the teaching–learning process and the reflection of teachers and students on this subject changing as a result of UDL approach implementation?

As a result of joint discussions with teachers, management and students, permission was obtained to continue the research project and make an attempt to implement certain modifications (consisting of UDL approach implementation). The impulse to launch changes in the teaching–learning process in the class under study was to guide teachers by providing them with knowledge about the UDL approach (which was expanded in subsequent periods), indicating specific UDL approaches and stimulating their motivation to that extent. It was possible because teachers and students showed, despite the previously mentioned concerns, openness and readiness to work. Moreover, the teachers showed awareness of the upcoming changes in the education system and its transformation towards inclusion.

This was possible, among other reasons, because in the course of regular meetings of university researchers, teachers and students, we created a kind of community and learned from each other. We learned about the concerns experienced by other participants in the change that had started and, most importantly, we strengthened each other by sharing our constructive ideas. The mutual learning had not only a local dimension but also an international one—through visits to partner universities and schools, we were able to learn from each other's good educational practices, and more broadly, to learn a new view of diversity. In this way, we began to see/ understand student diversity much more as a value, which in turn convinced us more and more that inclusion was the right direction for changes in education.

Analyses carried out under the action research allowed capturing the changes that took place during Polish, math and history classes under the influence of the UDL approach implementation. These changes concerned, inter alia, enhancement of students' awareness of lesson objectives and providing them with opportunities for different ways of meeting lesson objectives and the related diverse forms of work.

Modifications made by the teachers resulted in a gradual departure from whole-class teaching and the involvement of students in teamwork. Students became more and more consciously involved, thus becoming increasingly active learners. As they said themselves, they felt motivated when the usefulness of the acquired knowledge was shown to them and also when options to perform and express themselves were made more attractive through their diversification.

It should be noted that teachers began to identify factors conducive to the implementation of the UDL strategy. One such factor was the ability to combine two lesson hours into one block, which created an opportunity to act more freely in the lesson and at the same time to achieve the goals more fully. Another factor noticed by the teachers was the structuring of the students' activities by defining transparent rules of in-class work.

Supported by long-term counselling, teachers and students alike began to see the value of change in the implementation of the UDL approach. This, in turn, led to the disappearance/reduction of fears of ongoing changes.

At the same time, the teachers did not give up on noticing the barriers hindering UDL approach implementation. What is more, their formulation indicated a more thorough analysis of the current experience and confronting external obstacles resulting from the formal and legal solutions in force in the Polish educational system and (limited) resources (e.g. classroom equipment, teaching aids) at their disposal. Also, a barrier was the resistance of students to entering into new relationships for cooperation with other students, as they clearly preferred work in permanent teams.

Faced with these barriers, teachers and students adopted an active attitude, that is, they attempted to overcome them. The visible commitment and satisfaction of students became motivating for teachers.

5.2 Research on How the Teaching–Learning Process Changes in Implementation of the UDL Approach: The Example of One Integrated Class in Poland

Even though a greater chance of success is assured by innovative grassroots initiatives proposed by a specific team of a given establishment that is known locally and that build greater trust than external reformers, we need to consider barriers that might appear. Thus, according to theoretical and empirical premises (Arends, 1995; Baran, 2000), the following barriers could be expected in UDL approach implementation in the selected class for research on the teachers working in it:

– Teachers of a given school are sceptical about a method tried elsewhere and consider it less reliable.
– Teachers have more confidence in the reformers they think they know about their local conditions (school, local, cultural, etc.).
– External persons, that is, scientists and researchers, the representatives of institutions who do not belong to a certain school, seem unreliable to the teachers.
– The introduction of such methods, which are based on at least partial knowledge of the changes introduced by local participants, is more effective.

Moreover, in accordance with the phases (Arends, 1995), of teachers' attitude towards innovation, that is, awareness, information, personalisation, action, consequences, cooperation and rationalisation, as specified by Fuller, it was considered of great importance that the duration of attempts to apply elements of the UDL approach, the frequency of contact of researchers with them and the reaction of students to changes in the way they work in lessons will be of great importance. This means that for the research it could be a good direction to study the teaching–learning process while implementing an innovation, to monitor teachers' and students' activities during lessons and to observe whether they are aware of the transformations both in their teaching–learning activities and their interactions and whether they discover them as useful, comforting and bringing them any kind of success. These factors might support the positive perception of the changes and willingness to continue innovation both by teachers and students despite the origin and nature of new strategies used during lessons.

The main research question was formulated: How is the teaching–learning process and the reflection of teachers and students on this subject changing towards inclusive education as a result of UDL approach implementation?

Due to the action research methodology, the action plan was designed for:

– Initiating and encouraging teachers and students to modify their existing routines during lessons, including the following:
– Making students aware of the objective(s) of the lesson(s) and emphasising an option for practical application of the knowledge gained at school in real life
– Suggesting to teachers that they should enable students to choose methods for achieving their goals, for taking actions and expressing themselves

– Giving the choice of the work style (individual, in pairs, in a small group formed by students themselves), reinforcing cooperation between students
– Initiating reflective assessment of the teaching/learning process by teachers and students as a result of the UDL strategy implementation

After a period of actions, their next steps were included in the plan:

– Training teachers to use different, more innovative and diverse ways of assessing student performance
– Training students in self-assessment and self-control (encouraging them to move away from external motivation and to apply internal motivation)
– Joint development of a 'lesson guide' as a tool for activating students and helping to stimulate self-reflection (reflective learning)

The main focus was placed on implementation of some UDL strategies by teachers, suggested by researchers, and above all:

– Focusing on giving students the objective(s) of the lesson
– Giving students a choice to achieve that objective—making different ways of taking action available to the students
– Encouraging cooperation
– Encouraging and mobilising teachers to plan and implement education taking into account the UDL principles
– Providing methodological support to teachers and ongoing discussions on problems arising during class work

The selected four school teachers, under the guidance of researchers, started to implement the UDL approach in one integrated class of VI grade. It has been assumed that following the instruction of researchers, using the UDL approach in the classroom will improve students' interest in a given subject (Polish, mathematics, history) and improve their motivation to learn and become active learners—experts in their own/independent learning.

Regular observations, talks and interviews generated quite rich inputs, confirming the changes were taking place. Their clear manifestation began to occur approximately in the middle of the research. However, at the beginning, during the first regular visits to the school, interviews with the teachers indicated clear resistance to continuing the work strategies proposed to them. The attitude of uncertainty and lack of conviction as to the need for work efficiency in compliance with the UDL assumptions is expressed by the words of one of the teachers during the debriefing after one of the first lessons:

Teacher Cecil: *I'm not sure if everyone has understood the lesson objective. This is difficult for many students in this class.* (Reflection with researcher, 29)

Other teachers wrote in the survey form summarising their classes:

Teacher Bella: *There was some noise that sometimes disturbed.* (Reflection with researcher, 28)
    Teacher Agnes: *Usefulness of the knowledge gained during class ... maybe they noticed ...* (Reflection with researcher, 27)

When arguing that there was no guarantee of success in the initiated activities, teachers usually referred to specific examples, that is, difficulties of certain students in school operations, their disabilities and the need for a personalised approach. They formulated barriers:

> Teacher Cecil: *The barrier (during the observed lesson) for everyone was the behaviour of a student who does not control himself* in *stressful situations. It hampers concentration of other people. Students' activity is directed at something else (rather than at the lesson content).* (Reflection with researcher, 29)
>
> Teacher Agnes: *Writing and keeping up with work is problematic for some students.* (Reflection with researcher, 27)

Teachers' statements show that in their professional experience they focus too much on the students' difficulties and their weaknesses, which can be a major barrier to a positive perception of possible good changes as a result of implementing innovation in the teaching–learning process. In showing external difficulties, they probably find an excellent justification for their feelings of comfort, which might be supported thanks to the teaching routines they use.

The analysis of the content of all the collected materials, after the final agreement of the researchers, allowed the identification of specific, further presented categories of problems/phenomena that emerged as a result of the UDL approach implementation into the teaching–learning process in Class VI. They were arranged at two levels as main topics/themes and more specific sub-themes.

Perception of the Change Value

The Sense of Realising es The teachers, despite their resistance, observed the phenomena occurring during their work with students in the classroom and referred to the specific actions proposed to them as part of the UDL approach. One of the signs that teachers began to draw their own conclusions appeared in the following reflection, signalling the mobilisation for change:

> Teacher Bella: *I think that the students did not even pay attention to the objective of the classes (...) Next time I'll try it differently—I'll emphasise the objective of the classes and the need to carry out such classes.* (Reflection with researcher, 28)

Only 2 weeks later, it turned out that in a written report after the lesson, the teachers had already expressed their confidence in the fact that the students understood the objective of the lesson, but still had doubts as to whether the way it was presented was appropriate and whether all the students liked it.

After a month of regular classroom visits in a personal interview, one of the students said after history classes:

> Patryk: *Yeah, I knew what the point of the lesson was... but I liked it because the teacher asked a lot of questions to everyone. (...) It was worthwhile learning it, because it can be useful in real life to know where you come from ... there were cool pictures during presentation.* (Reflection with researcher, 20)

Kamil: *The teacher explained exactly what were they going to do.* (Reflection with researcher, 21)

Thus, the value of change was soon to be seen, including, first of all, the sense of making the objectives of the lesson/learning and adapting the ways of presenting them to the needs of students.

Teacher Cecil: *I think the students knew that they would need this knowledge during the test. They took active participation in the classes.* (Reflection with researcher, 29)

Kamil: *You (the teacher) said* exactly *what we will know after the lesson.* (Reflection with researcher, 21)

As the lessons followed, it became increasingly apparent that teachers were consciously directing their students towards explaining the purpose of the lesson in combination with demonstrating the usefulness of the acquired knowledge, and towards presenting and making available to the students the different ways of achieving it. The following teacher's comment was noted:

Teacher Bella: *I think that there as a sign of growing awareness—a different approach stimulates curiosity, activity.* (Reflection with researcher, 28)

Perception of the Sense of Showing the Practical Application of Knowledge and Skills One of the questions addressed to the teachers concerned the assessment of whether the students had noticed the usefulness of the knowledge acquired during the lesson and was connected with the request to determine whether the students were motivated for the activity. One teacher's reply indicates that he saw a close link between these issues and the proposals for action made to the students:

Teacher Agnes: *Some of them certainly (by implication: they saw the usefulness of the knowledge gained in the lesson and were motivated), especially as they like group work and 'guessing' elements (…) In my opinion, it is important for students to be able to apply their knowledge in practice. It is a sign of content understanding.* (Reflection with researcher, 27)

The students' statements on this issue are also significant:

Mira: *This could come in handy in an adult life. If we gonna have our kids one day, it'll come in handy because we can explain to them.* (Reflection with researcher, 19)

Igor: *I liked it because I know how to connect what was (learned in history) with what is now (he sees the connection between past and present).* (Reflection with researcher, 24)

The teachers, using the knowledge, but also the various teaching aids proven in their experience, started to adapt them to the assumptions of UDL and, in principle, did not expect any suggestions in their decisions about these actions or about the forms of work with students. In discussions with researchers, they often announced what they intended to do in the next lesson and usually demonstrated confidence in the validity of their plans. These conversations before, but most often after the lessons, confirmed to the researchers quite quickly that the teachers participating in the project do not need detailed instruction. Thanks to their competence and professional experience, they have begun to make changes to their routine in lessons in a smooth manner. It could be seen that their approach was strengthened by the higher activity and interest of the students and their growing responsibility for their own

work. One of the teachers, when asked about changes in the students' awareness of the learning process, said:

Teacher Agnes: *I think that every lesson brings something new. I want students to feel the sense of the work they are doing and the responsibility for it.* (Reflection with researcher, 27)

Satisfaction With the Different Forms of Action and Expression Available in Class and Their Effects With every consecutive lesson, teachers and students strove to continue gathering experience related to changing the in-class activity. Teachers signalled to the researchers that the students have started to ask themselves about the work method being implemented. Thus, the method has become visible and satisfaction expressed with the forms of activity, which were not completely new, but so far less frequently used. In an interview with a student, one can see his experience of a positive emotional experience:

Researcher: *Are you satisfied with what you did during this class?*
   Mira: *Yes, and I had a lot of fun.*
   Researcher: *Why did you have a lot of fun?*
   Mira: *Well, because it wasn't difficult, it was just so... well... so interesting.* (Reflection with researcher, 19)

One of the teachers wrote a lesson report and her own conclusions:

Teacher Bella: *Students worked individually and in groups. Assignment level—varied. The students had to choose location and action plan. Students were highly active, everyone was working busily. A very interesting experience. (...) Initially the students did not have any ideas, they used ready-made examples, but their creativity was stimulated during the classes. (...) I will try to do the same with the lesson (addition: from the next topic), but I will prepare the 'grounds' by presenting more examples.* (Reflection with researcher, 28)

The remaining teachers confirmed the experience that the students acquired in order to gain knowledge on their own, which gave them methods of action, bringing them satisfaction:

Teacher Cecil: *(Students) already know that there are different ways of gaining knowledge (watching, listening, movement, own creation).* (Reflection with researcher, 29)
   Teacher Agnes: *I'll use activation methods.* (Reflection with researcher, 27)

Another example of a student's satisfaction with a class, expressed during an interview:

Lucek: *Oh, cool... very good explanation. (...) The class was held very well, I think it might not have been better.* (Reflection with researcher, 23)

The same student, when asked after the next lesson about the means by which he chose to work and why, said:

Lucek: *I picked up a map because I read ... I prefer to work with the map than with the text (...) Although I don't like (the name of the object), I really like this way (action).* (Reflection with researcher, 23)

Appreciation of the Cooperation Value Conventional teaching is primarily whole-class teaching, with the predominance of collective or individual work. This is also confirmed by the statement of one of the teachers:

> Teacher Agnes: *We teachers like this kind of whole-class teaching (…) it is also economical, conventional teaching, in the form of chatting, lecturing; we save tim*e. (Reflection with researcher, 27)

However, group work, although it was not unknown to the teachers or their students participating in the project, did not occur very often during classes. The reasons for this fact will be further explained, and attention will be paid here to appreciation of and breaking resistance to the group work by the participants of the teaching–learning process in the surveyed Class VI. Our observations at the project onset showed that the teachers were not very keen on following up the experience of organising students' work in groups. Many times they emphasised in their interviews with researchers, most of whom have already had at least a dozen or so years of experience, that they appreciate the order in the lesson and a kind of silence that not only promotes concentration of students, but is even necessary for some of them, due to certain difficulties in functioning, and preferred by others:

> Igor: *It's not that I don't like them (other students). I just like to have peace and quiet, because sometimes when you work with someone, others make noise and sometimes there are arguments*. (Reflection with researcher, 24)

After the first lessons, the teachers clearly pointed out the shortcomings of group work:

> Teacher Cecil: *Some students had a problem with group communication—(there were) different ideas for a drawing (project)—(overcoming difficulty is) ability to compromise*. (Reflection with researcher, 29)
> Teacher Agnes: *I'll try to achieve greater, superior work discipline*. (Reflection with researcher, 27)

This statement showed that the students need training in collaborative techniques in a group, that finding compromise is an important skill they should learn and that the opportunity to do so is provided by working in a group.

Gradually, both teachers and students, appreciating the various qualities of group work, paid less attention to emerging difficulties in cooperation and sought to maintain this form of activity, necessarily working out ways to reach a compromise. Both teachers and students began to point out those qualities that were related to the development of: cognitive competence—acquiring and verifying knowledge, skills (practical knowledge processing), social skills—learning to cooperate, share knowledge and help.

> Teacher Cecil: *The idea of group work (joint project-drawing) proved to be beneficial in this topic. The students memorise the contents of the lesson in a pleasant manner*. (…) *The work was creative; they could plan themselves where their building will be (the facility specified in the task)*. (Reflection with researcher, 29)
> Teacher Agnes: *They (the students), thanks to the fact that they can work in pairs or small groups learn to cooperate, and this is very important in later life*. (Reflection with researcher, 27)

Interestingly, the students talked much more about group work than the teachers, but it should be noted that the questions addressed to them were worded in such manner that they were directly related to this problem.

> Kamil: *It's worth it, because if you say something wrong, another person can think along with you.* (Reflection with researcher, 21)
>
> Adam: *I could learn something and pose questions to others.* (Reflection with researcher, 26)
>
> Patryk: *You can learn to be ingenious, for example how to work in groups and make something up.* (Reflection with researcher, 20)
>
> Adam: *Because we can work together, get to know one another, to learn what are our strengths and weaknesses. For example, I know that X is better with inventing things, and performs worse when he writes and draws.* (Reflection with researcher, 26)
>
> Patryk: *(By working together) you can learn and help one another (student).* (Reflection with researcher, 20)
>
> Lucek: *Well, it's worth it, because in the future it may come in handy at work too, we're not likely to work alone.* (Reflection with researcher, 23)

Identification of Factors Conducive to UDL Approach Implementation

In the focus group interview, carried out to sum up the implementation of the project, important observations of the teachers were collected, in which they expressed, among other things, their satisfaction with the acquired experience of UDL approach implementation. Among the comments made, interestingly enough, there were clearly positive conclusions. Moreover, one might venture an opinion that on the basis of the arguments presented and the positive emotions felt in the teachers' voices, that they were not only satisfied but also pleasantly surprised by the changes in activity observed in the classroom, and even managed to identify some kind of feeling of comfort, instead of the fatigue they experienced while working with students. The comment about traditional teaching by one of the teachers seems to be significant:

> Teacher Cecil: *To date I have been terrified by the fact that some children did not take anything out of class. …. When we have conventional class, I can't always mobilise them.* (Reflection with researcher, 29)

The analysed reflections of the teachers from the recorded interview are grouped into the themes discussed.

Extending the Time for the Lesson Topic by Combining Two Lesson Hours into One Unit The statement, as quoted earlier, that traditional teaching is 'economic' has been contrasted by teachers using so-called time management with the UDL approach in the following statement:

> Teacher Bella: *I can do this (implement UDL strategies) only if I have two hours in a row with them. I'm happy that the headmaster gave me that extra hour on Tuesday (for my subject).* (Reflection with researcher, 28)

Other teachers shared this conviction, admitting that a 45-min lesson unit is not enough to complete the topic, especially as there are often unforeseen organisational or educational problems, and different information is given to students, which takes time. We have to admit that a teacher cannot and should not wait to address certain problems until a weekly class meeting (1 h a week), as a result of which, after discussing some important issues, for example, educational issues, he or she has reduced time for topic discussion and resorted to so-called economic strategies. The opinions of all teachers involved in the project were unanimous in the sense that if a teacher has a block of two classes equal to 2 h on a particular day, he or she can perform more effectively while implementing all lesson phases:

> Teacher Cecil: *(Teacher) has (time), can approach any student.* (Reflection with researcher, 29)
> Teacher Agnes: *Before (students) do some work (during the first hour), then during second hour (the teacher) will present a summary, have a discussion, make an assessment.* (Reflection with researcher, 27)

In the absence of such a daily schedule, one of the teachers has adopted the following solution:

> Teacher Cecil: *When there's a lesson and there's no time for debriefing, I'll do it in two days, when I have a class. ... I don't think it's a bad thing.* (Reflection with researcher, 29)

The specific race against time seems to be a burden for teachers; they would like to have the opportunity to have individual contact with the student during the lesson to be able to give students more time for action, as they know how it is important for the sustainability of knowledge and the students' commitment to the teaching–learning process. From the teachers' words a postulate emerged that timetables should be reorganised in such a manner that it would be possible to work with forming lesson units, that is, that there are two lessons on a certain topic on a certain day, the so-called unit. This would provide a chance to hold classes following the UDL approach with a feeling of comfort enjoyed by the teacher and by the students.

Structuring the Students' Activities by Clearly Stating the Objective and Formulating Transparent Rules of In-class Work Teachers were asked to clearly formulate and give students the objective(s) of the classes and give them a choice of how they wanted to achieve such objective(s). In the debriefing interview, they admitted that at first, they were surprised that researchers cared so much about this, but they also admitted that over time they observed that taking care of these conditions clearly improves students' motivation:

> Teacher Bella: *At the beginning I wondered why the researchers want to ... repeat, repeat, again and again ... But there is something about it … And in fact, why they need it (what they will learn in class) ... and that is the source of their motivation. ... This project has helped me understand many things.* (Reflection with researcher, 28)
> Teacher Cecil: *Kids like to know—what for?* (Reflection with researcher, 29)
> Teacher Agnes: *It is necessary because it is visible even from the students ... to present this goal in a variety of ways, I can see that it really works ..., and this motivation is anchored in them somewhere—that it makes the whole effort worthwhile.* (Reflection with researcher, 27)

Closing the topic of the purpose of the lesson and using examples from various professional experiences, one of the teachers, followed by the others, stated:

Teacher Cecil*: But it's not that new*. (Reflection with researcher, 29)

During their interviews, while talking about various topics, the teachers pointed out the importance to them of discipline in the classroom, in which they referred not only to the lack of chaos and noise but also to the specific order of the lesson, the lack of disturbances caused by unexpected difficult behaviour of some students, visible concentration and work and a culture of discussion. This means that they feel responsible not only for organising but also for managing and fully controlling the teaching–learning process.

Teacher Cecil: *(When) I'm going for classes, (I think) I'll see if they are in the mood, what's up … but I'm putting the situation in order, (I care about) what I want to achieve and what they'll learn from this class*. (Reflection with researcher, 29)

The fear of chaos in the classroom as a result of the UDL approach made them consider the introduction of contracts/principles useful, as they themselves gave 'voice' to the students, relying on them for a fully predictable lesson as a result of the introduction of various forms of work, and above all, group work. An illustration is the following statement:

Teacher Agnes: *I cut short all off-topic comments, because they like to talk, and some people find it very disturbing. That's why I write these ground rules on the board, how to behave (while working in class).* (Reflection with researcher, 27)

In the interviews, the students commented on the situations that occurred during classes and their course as follows:

Hubert: *It wasn't loud, … everybody could say something.* (Reflection with researcher, 22)
Adam: *It went well, because we knew what to do and Y (a student) didn't disturb.* (Reflection with researcher, 26)
Patryk: *I didn't understand everything right away, so our teacher had to explain it.* (Reflection with researcher, 20)
Hubert: *The students are more polite than last year and the teachers are doing their best.* (Reflection with researcher, 22)

Students' statements confirm that if teachers follow UDL rules by structuring their activities while formulating the objective clearly and stating transparent rules of in-class work, then the students are satisfied and positively relate to the teacher's expectations, but at the same time have a sense of free choice in their success; they feel motivated to act and also to cooperate with others in the classroom.

Identification of Barriers Preventing Change and Striving to Overcome Them

The question addressed directly to the teachers, during the focus interview, concerned the current and anticipated barriers to changes in the teaching–learning process. The discussion stirred by the question confirmed the shortcomings of the existing education system. The obstacles and difficulties mentioned explicitly, including those not fully named by the teachers, which may significantly limit the full application of the new/proposed solutions or may be a reason for giving up the initiated changes, are presented by the researchers in the description below.

Time-Consuming Planning and Preparation of Classes According to the UDL Rules—The Effects of Students' Work Are Not Always Equal to the Teacher's Workload Related to Class Preparation The feeling of making full use of the material prepared by teachers for students during classes turns out to be an important factor, combining the time-consuming work with the use of the UDL approach. If a work exercise does not stir students' interest, that is, nobody decides to do it, the teachers perceive this as a waste of time for its preparation, moreover, as an underestimation/lack of recognition of the proposed activity's usefulness/significance to knowledge.

> Teacher Agnes: *(It takes time) for the teacher to get prepared (for the classes), exercises, tasks of the proposal. … It turns out that (students) do not always want to use/do them all.* (Reflection with researcher, 27)

This example shows how important it is for the teachers to attain at once all goals that arise from the core curriculum during classes. Being aware that a certain knowledge has been 'discovered' during a particular class or that students have acquired a certain skill resulting from a planned task/exercise/activity form is a 'reward' for the teacher's time spent for class preparation.

Time Required for Class According to UDL Rules Accusing the UDL approach of time-wasting is related to the factor discussed above that is conducive to the application of the UDL approach, that is, the realisation of the class topic in a 2-hour unit. The accusation is nothing more than a belief, or perhaps rather a concern, about the low efficiency of work in line with the UDL approach assumptions. Unfortunately, teachers are convinced that the number of exercises performed in class shows effectiveness, as if they missed the value inherent in the quality of the activity, related to the independent pursuit of knowledge by students and their commitment to the learning process, which, as we know, bring much longer lasting results. However, what was important in the manner in which the teachers expressed their comments/barriers was not so much evaluating and negative argumentation as a kind of rational acceptance of their occurrence. Thus, an attitude is revealed that can be verbalised as follows: it is a fact that the barriers do exist, but one can still act. The following statement is evidence:

Teacher Cecil: *The lesson lasts only 45 minutes. This is very little time and prevents more interesting ways of working*. (Reflection with researcher, 29)

    Teacher Agnes: *Certainly, the UDL approach makes the curriculum slower … It is not efficient*. (Reflection with researcher, 27)

'Dictatorship' of the Core Curriculum For many years now, public and scientific debate has focused on the criticism of the Polish school for its traditional approach to teaching methods and the rigorous requirement to implement the core curriculum, which is related to external control. Students after certain stages of teaching are subjected to examinations, which are developed by third-party education supervision units. The teacher is being held responsible for whether and how, that is, with what grade, the student passes these exams. In addition, the schools are ranked both at the local and national levels and such lists are published later on. In a focus group interview with the teachers, important statements were made:

Teacher Cecil: *Students must learn everything (because it is), the core curriculum, not what interests them, what may come useful to them in life*. (Reflection with researcher, 29)

This fact was discussed as another barrier hindering the implementation of UDL in the Polish schools. In order to strengthen opinions, it is worth referring here once again to the words already quoted indicating that teachers feel they are prisoners of the (education) system.

Pressure Exerted by the Educational Authorities to Teach the Students Based on the Overall Material The dictatorship of the core curriculum is connected with the rigorous adherence of the educational authorities to the deadlines for the realisation of the planned teaching material, which is additionally checked by external examinations. It is also common for students' parents to check whether teachers 'work effectively':

Teacher Agnes: *If we give them (students) more flexibility, not everything will be mastered and the exam is required (core curriculum established by the Ministry of National Education)*. (Reflection with researcher, 27)

Misconception of the Teacher's Role Teachers feel overburdened with many professional duties as, in addition to the teaching process, they spend a lot of time on the bureaucracy involved in completing various school documents and those required by teaching supervision. The cooperation with the students' parents can be very arduous, especially since many of them, like education managers, hold teachers responsible for situations and objective difficulties arising in the teaching–learning process that is completely independent of them and their actions. The role of the teacher being confused with the role of other actors/systems related to the students and held equally responsible for them is a complaint made by one of the teachers:

Teacher Cecil: *We are responsible for everything that happens at school, for instance: bad behaviour (of students), their poor grades*. (Reflection with researcher, 29)

Parents' Pressure to Prepare Their Children Well for the Final Exams The control of teachers' work by the students' parents manifests itself also in the pressure to ensure that their children learn first and foremost at school, allowing them to take their final exams without fear.

> Teacher Agnes: *Parents' expectations vary; some parents want us to do a lot of homework, whereas other parents believe that school does not mean everything in children's lives.* (Reflection with researcher, 27)
>
> Teacher Cecil: *Parents ask if the material (curriculum) execution goes well and if (students) have mastered it well.* (Reflection with researcher, 29)

Identifying 'Educational Success' With Being Ranked High The consequence of a student taking the final exam is to achieve a high score, and this requires not only knowledge but also so-called examination efficiency (Chrzanowska, 2015, 581; Gajdzica, 2013). These are the expectations of parents because most of them plan their child's future according to educational success, which is expressed by the student's achievement of the highest grades in (primary) school. High achievements become a guarantee of a student's admission to a specific secondary school that his or her parents have on their minds.

> Teacher C: *It is important for parents that their children are ranked high enough to enrol in secondary comprehensive school.* (Reflection with researcher, 29)

Teachers feel strong pressure exerted by the parents and find that they are held accountable for the successes and failures of the student.

Students Disclose Desire to Cooperate Always Within the Same Team—Habit and Being Closed to New Relationships During the implementation of the UDL approach, the teachers offered their students various ways of getting into the group as a part of their joint work. Unfortunately, the students agreed to work in a team with a different composition only with great resistance. During interviews, they tried to convince the researchers in the following manner:

> Lucek: *If we cooperate with someone from the other end of the classroom, then ... most probably it will not work out.* (Reflection with researcher, 23)
>
> Adam: *We could choose in which group we want to work. I worked with my crew. We're friends and after classes we see one another off.* (Reflection with researcher, 26)

As in any community, there were also those students who were reluctant to cooperate and chose to act independently.

> Igor: *I prefer to work on my own. This is my favourite work style. During my next class, I would go for the same thing.* (Reflection with researcher, 24)

5.3   Changes in Teachers' and Students' Perception and Reflection in Teaching–Learning Process of Inclusive Education by Implementation of the UDL Approach

The results of the research can be summarised by a statement referring to the attitude that has started to be clearly visible in both teachers and their students: it is worth trying to introduce changes in the process of teaching and learning; it is worth trying to break the routine. One should not be afraid of changes because they bring positive results.

The research enabled us to capture evolving attitudes of teachers and students that have been revealed under the influence of UDL approach implementation during Polish, math and history classes. Teachers began to attach greater importance to making students aware of the lesson objectives, creating opportunities to differentiate the ways in which they achieve lesson objectives and more frequent use of different forms of work. This resulted in a gradual abandonment of whole-class teaching in favour of teamwork with student participation. Initially, teachers felt discomfort caused by more easy-going atmosphere during classes and the fear of failing to achieve the core curriculum within the prescribed timeframe. Over time, however, they and the students began to feel satisfied, especially with growing mobilisation of students to perform, and thus their motivation and activity during classes. As a result of these changes, the value of change was recognised.

Teachers reported that being aware of lessons/learning objectives works well and makes sense. During interviews carried out after Polish, math and history classes, the students revealed the awareness of the practical application of the knowledge they learned or they mentioned its usefulness for the future. They appreciated that teachers at the class beginning formulated specific objectives and identified the usefulness of what they later learned. The teachers and students clearly stated that it made sense to show the practical application of knowledge and skills.

Pursuant to the UDL approach, the teachers were given guidelines for thoughtful application of various forms of in-class performance and expression by the students. This led to the situation where, in addition to the strategy and workstyle developed by them in parallel to professional experience acquisition, they modified both in-class measures and the ways of involving students in activities (projects, models, schemes, drawings, student work in diversified and evolving work groups). Recognising and appreciating the outcome of these measures, students and teachers started to express their satisfaction with the availability of more diverse forms of in-class activities and expression.

The assessment of the outcome of the UDL approach application based on the empirical data collected during the research also applies to the identification of factors conducive to the undertaken implementation activities.

The teachers themselves mentioned the need to extend the time to complete the lesson subject by means of combining two lesson hours into one block and structuring students' activities on the basis of clearly defined goals and laying down transparent rules for in-class activities.

By making a generalisation of the parts discussed and identified themes and sub-themes in the statements of the teachers during the implementation of the research project, it can be concluded that the experience of teachers and students began to confirm the perception of the value of transforming the conventional teaching process into the students' learning process, understood in a constructivist manner.

This phenomenon should be noted, since it is desirable and expected not only due to the application of the UDL approach, but, above all, due to the recommendations for practice generated by a radical theoretical change in pedagogy, that is:

– Changes in the student's field of activity and the teacher's attention (a different area of control and self-control; orientation at the knowledge acquisition processes, not only performance-oriented; monitoring instead of controlling, etc.)
– Changes in the content, time and space management (in place of rigid management and an external plan, the principles of flexibility, content personalisation, wide availability of space and sources, etc., start to operate)
– Focus on individualisation (which turned out to be more knowledge-forming than collective teaching, which does not respect individual resources) (Klus-Stańska, 2019, 15)

In addition to the positive reflections of teachers coming from the reflection about the changes they observed in the teaching–learning process, and thus, changes taking place in students, it was noted that barriers hampering change were perceived, as well as the desire to overcome them.

Opinions formulated by teachers and reported inconveniences concerned, first and foremost, the time-consuming planning and class preparation according to the UDL rules. It was emphasised that the outcome of students' work is not always equal to the teacher's workload pertaining to class preparation. It can be assumed that teachers would not complain about the incommensurability of efforts and benefits if they were not burdened with various extra work, including in particular work related to formal documentation, drawing up various types of reports, etc. They did not consider the fact that with the acquisition of new experience they will develop economic strategies for lesson development in line with the rules of the UDL approach.

Another barrier mentioned by them was the overbearing nature of the core curriculum, that is, ministerial regulations with requirements for teachers in terms of the necessity to implement the core curriculum with all students within the formally prescribed timeframe. Additionally, the pressure from the education authorities to complete the whole curriculum made the impression of yet another barrier. This fact is indeed reflected, inter alia, in the applied external controls. The misunderstanding of the teacher role is another argument formulated by the teachers as evidence of imposing extra non-didactic duties on them. In their opinion, not only students' parents but also pedagogical supervision, impose expectations on the school management and teachers that go beyond their competences, which sometimes lead to undermining of their profession, for example, blaming only teachers for all student failures. Although this phenomenon is very complex and has a broad social and legal context, the belief expressed by teachers, although not without validity, does

not take into account their attempts to limit their professional responsibility to only selected scopes of activities (Groenwald, 2013).

Teachers, referring to the expectations of their students' parents, define another barrier in the implementation of the UDL approach, which is the accountability of teachers for their performance, pointing to the pressure exerted by parents to prepare their children well for the final examinations.

The so-called examination efficiency is the nightmare of Polish schools, limiting the freedom of teachers to act, and forcing students to make great efforts. This phenomenon is accompanied by the association of 'educational success' with a high position in the ranking, which the surveyed teachers consider as another barrier in UDL approach implementation. Unfortunately, the Polish educational realities have not yet been able to escape such a vision of student, teacher and school success. The rankings are common and advertised in many social media, especially in the press and on the Web. They are also submitted and expected in the reports to the world authorities.

Synthesising this part of the research project, the difficulties in teamwork shown by the students randomly assigned to various work groups should be pointed out. Their statements and behaviour during lessons show that they were willing to cooperate, but only in a regular community of peers. They did not like to change teams and could not appreciate the value of the experience of working in a new team. This phenomenon leads to the conclusion that students show strong inclination to stick to their habits of working in a permanent team and are closed to new relationships.

To this conclusion, it is worth adding the teacher's symptomatic utterance made during the focus group interview:

Teacher Cecil: *They (students) are thirsty for success.* (Reflection with researcher, 29)

5.4 Discussion and Conclusions: Teaching–Learning Process Changes Towards Inclusive Education Under Implementation of UDL Approach

The final interpretation and generalisation of the results from the action research, which was divided into cycles, are presented in a reference to the scheme showing the mechanisms of identified and documented changes, as well as the factors determining their course (see Fig. 5.1).

As indicated by the research presented above, the source of the changes taking place is of great importance to the success of innovation. The process of change is influenced by both the factors identified inside the process and those functioning outside, providing the context for the changes taking place. Although the stimulus generally comes from outside, it depends on the actor to what extent, how and at what rate the change will take place (Lubrańska, 2004). Openness and willingness to change is an internal factor that should be considered as its basic engine. It is worth noting that openness and readiness to change is initially associated with
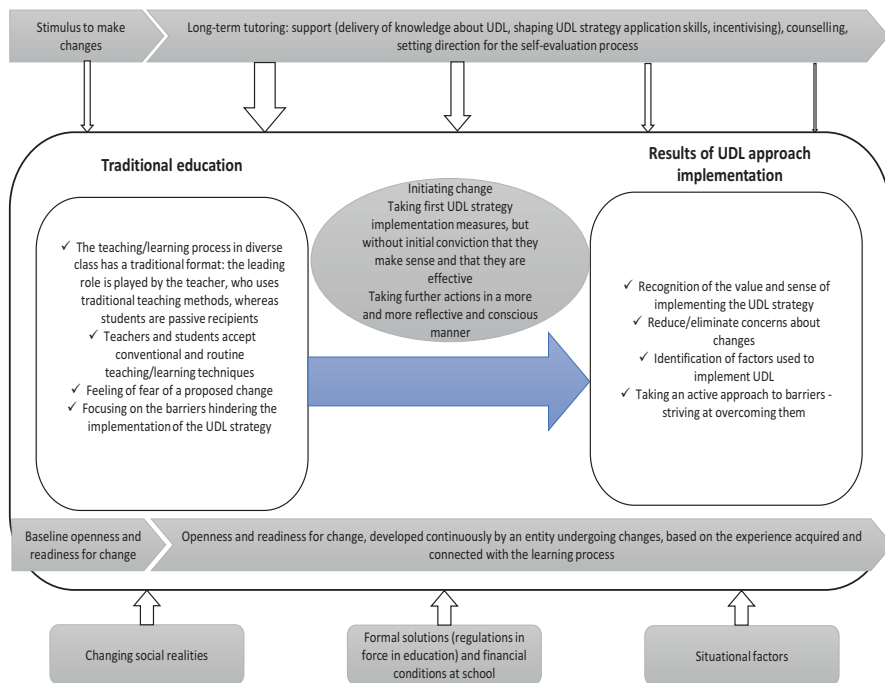
Fig. 5.1 Mechanism and determinants of changes in the teaching–learning process towards inclusive education under the influence of UDL approach implementation
Key: White colour—mechanism of changes, Grey colour—change drivers, Vertical arrows at the top—diminishing thickness means declining share of tutoring

personality traits, and secondly, it is based on acquired experience and manifests itself in constant development of the entity (ibid.) generating the change. It is an essential feature in the lifelong learning process that characterises the existence of contemporary humankind. Readiness for change is connected with further internal factors, that is, undertaking/initiating an action, despite the initial lack of conviction about its meaning and effectiveness, then perceiving the value and sense of change, determination to continue innovative activities and finally experiencing the positive impact of the changes introduced in the teaching/learning process. Therefore, in order to make a change, it is important to take action, even without full preparation, because the effects of this action are mobilising.

Among the identified external factors that foster change using the UDL approach in the class studied was providing an impetus to take action, which was to invite teachers and students to participate in the project. Another factor that continued the impetus was long-term tutoring, which offered support to teachers and students (i.e. providing knowledge about the UDL approach, shaping the ability to work with selected strategies and maintaining motivation for further action), as well as advice and evaluation of results. An important external factor driving change is also the changing social reality, including the appreciation of such values as well-being,

creativity, knowledge, responsibility and independence, cooperation and ability to solve contemporary problems (cf. Szempruch, 2012). The results of the conducted action research confirm that it is also important to create more favourable formal solutions, including modification of educational law and improvement of financial conditions of schools. In the presented research, a factor clearly hindering the course of change was the formal solutions in force in Poland, obliging the teacher to implement the 'overloaded' core curriculum and the system of external control to which the teacher is subject. This makes teachers afraid that if more flexible and innovative forms of action are introduced in the lesson, their work will be assessed negatively.

Analyses of the inputs collected through our own research are consistent with the findings of the professional teacher development model developed by Guskey (2002). Changes in education can be made through professional training and development of the teacher. However, this will happen when the teacher starts to perceive changes in student achievements and performance as a result of attempts to implement new strategies, etc. It is the changes taking place in students that change their beliefs and attitudes towards the proposed application of innovations and modification of their own actions in the student teaching and learning process.

The initiated changes would be hard to consider permanent if they were not confirmed by a need to continue the actions started. As with any process, the presented process of change in the teaching/learning system should continue and evolve in a manner that is relevant to the changing reality. The change in education is part of wider social processes and their transformations (Szempruch, 2012), so it is not possible to continue innovation in the teaching/learning system in a rigid manner in isolation from the social context of the operations of all entities involved in education (as evidenced by the global situation caused by the COVID-19 pandemic). The change in education is evolutionary by nature, although the resulting transformations may seem revolutionary in the sense that they seem to be reversing the current order of the teaching/learning process.

Given the great diversity of the needs and abilities of students in contemporary schools, it is necessary to strive to create the widest possible conditions for the successful implementation of inclusive education. The school should be an environment for all students to stimulate cognitive development and acquisition of knowledge for the twenty-first century, but also, and perhaps most importantly, a place to establish and develop relationships, especially with peers, including the ability to cooperate, solve problems and be open to diversity in the broadest possible sense. The implementation of strategies based on the UDL concept seems to be a good direction for changes that should be promoted in school education to prepare students to meet the challenges of the modern, ever-changing world.

The implementation of the educational process in compliance with the UDL assumptions makes education at every level:

– Available in an attractive form for every student, regardless of their difficulties
– Flexible in form, adapted to the student's preferences and abilities
– Intuitive and accessible to all, including students with limited competences
– Perceptually accessible for the students with impaired eyesight or hearing

– Friendly due to its implementation in a space arranged to match the students'
  needs (e.g. limiting the number of stimuli and allowing for silence for those who
  need it)
– Uncomplicated due to the use of teaching materials that are easy to use
  (Domagała-Zyśk, 2017, 14)

An unquestionable value of inclusive education implemented under the UDL
model is the opportunity for students to make choices in many different aspects, for
example, the choice of specific objectives they want to pursue, the choice of the
form in which they want to learn (individual, couple or group work), the choice of
didactic means they want to use or the choice of forms of expression of acquired
knowledge or skills. Therefore, the students have the opportunity—through genuine
commitment—not only to become responsible for their own education process but
also to help their schoolmates by means of peer tutoring.

In this context, the teacher's role is also changing. From the asymmetrical posi-
tion of the one who teaches, he or she becomes a tutor and partner of the students in
their own activity.

All of this, however, requires significant transformations of school reality. Is it
worthwhile to make this effort? For the reasons mentioned above the answer is yes,
by all means. However, one must face the fact that changes in education cannot be
introduced using a top–down approach, or in a radical manner. School reality needs
re-engineering. It is necessary to identify existing barriers, one by one, to reflect on
them, take and modify actions, assess their effects and start the process of education
reengineering from the onset.

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Chapter 6
The Use of the UDL Approach as a Factor in the Success of Inclusive Education Despite the Pandemic Period

Jolanta Baran (ID)**, Tamara Cierpiałowska** (ID)**, and Ewa Dyduch** (ID)

Abstract The action research reported in this chapter lasted for one semester. This was a novel time because schools, due to the COVID-19 pandemic, suspended their in-person activities and implemented online learning. This has necessitated the formulation of research purposes and problems appropriate to the dynamically changing educational reality (and beyond). This chapter provides a theoretical background to the risks to education during a pandemic. The assumptions, implementation and results of the research project implemented by the action research method in the selected Polish class are also discussed. The empirical data, mainly qualitative, triangulated by various sources of information, reconciled perspectives that were used to identify specific topics and threads appearing in the gathered inputs, to present it in an orchestrated manner and to interpret it. The analyses carried out lead to the conclusion that the application of the UDL approach promotes the success of inclusive education, despite the difficult experiences of the pandemic period. It has been proven that UDL approach implementation has a positive impact on the course of the teaching-learning process, optimises it to enhance the activity, commitment, self-reliance and responsibility of students and develops their cooperation, which breeds inclusion in education. The extraordinary situation faced by teachers and pupils due to the need to switch to online learning, contrary to temporary concerns, has reinforced the changes brought about by the implementation of the UDL approach in the learning process.

Keywords Inclusive education · UDL · COVID-19 · Online education · Teaching-learning process

J. Baran (✉) · T. Cierpiałowska · E. Dyduch
Pedagogical University of Krakow, Krakow, Poland
e-mail: Jolanta.Baran@up.krakow.pl; tamara.cierpialowska@up.krakow.pl;
ewa.dyduch@up.krakow.pl

6.1　Introduction: Education in the Pandemic Period—Risks and Opportunities for Changing the Teaching-Learning Process

The COVID-19 pandemic and the closure of schools have put teachers and pupils (and their parents) in a new, extremely difficult situation. This brought a great challenge to the entire educational environment, which had to adapt rapidly to the new working conditions. As a matter of fact, the pandemic and its limitations are seen in terms of difficult situations (Sliż, 2020) and even shock (Cellary, 2020) in many areas of human activity, and in a particular way, this shock has affected education.

As Jemielniak (2020, 35) somewhat humorously notes, the need for a sudden transition from traditional to online learning occurred so violently and shockingly that 'the rapidity of change can be compared to learning to swim by participating in a *Titanic* disaster'. What happened in spring 2020 in education has been referred to as emergency online learning, that is, 'emergency transfer to cyberspace of forms of education' previously implemented in the traditional way (Kraśniewski, 2020, 40).

Although online education has advanced a lifeline during the pandemic, both scientists and practitioners agree that there are a number of different risks associated with changing education from traditional to online form. Many schools have started to change the form of teaching from at-school education to online education. It should be noted with sadness; however, that in Poland not all students have had the opportunity, especially during the beginning of the pandemic, to take full advantage of online learning, as some of them did not have their own computer equipment or were in need of sharing it with other family members. This situation has carried the risk of digital exclusion (Cellary, 2020) and, in addition, cost to education. In this situation, it is worth looking for innovative solutions and drawing on the experience of those who have been conducting online education for a long time (Tomczyk, 2020).

Among the risks associated with students staying at home and participating in education online, there are a whole series of worrying problems. The first is associated with a negative impact of this situation on the psyche. For every person, especially at a younger age, this new, hitherto unknown situation can result in a threat to mental health and can be accompanied by anxiety and a sense of uncertainty (Poleszak & Pyżalski, 2020). It is also difficult to control organisational issues. Thus, students who have hitherto been heavily guided and controlled by the teacher in a Polish school have had to take care of self-organisation and self-discipline themselves.

Online education also loosens peer ties and causes social isolation (Pyżalski & Poleszak, 2020). Limitation of social contact, especially with peers, can have serious consequences for a child's well-being and emotional development, which is why it is so important to support students in maintaining relationships with other children. The child, without participating in real-life social situations, gradually ceases to understand them. As a result, he/she can feel lonely and misunderstood and rebellion and aggression can emerge. That is why it is so important to create

opportunities for cooperation, for example, by planning online teaching tasks in such a way that they require group work.

The fact that sitting in front of the monitor for hours causes musculoskeletal disorders and causes visual impairments cannot be underestimated. Prolonged sitting and constant homogeneous movements (e.g., typing, using the mouse) strain the muscles in a static way and put pressure on the intervertebral discs.

Therefore, people sitting too long and too often at the computer are more likely to have spinal defects, scoliosis, pain in the neck, shoulder girth, back (especially lumbar region) and hands (especially hands). Intense and prolonged light stimuli coming from the monitor strain the eye, causing redness, burning and tearing of the eyes and blurred vision (Kukułka, 2006; Garwol, 2017). In addition, children who spend hours in front of the computer using the Internet may begin to treat it as an oracle and indiscriminately believe in its content, putting total confidence in its unlimited (in their view) possibilities. Instead of creating themselves and the world around them, they may begin to think and act schematically. Because of the impoverishment of contact with other people and the limitation of their knowledge to the virtual world, their knowledge of the real world may be incomplete. Modern media used in excess have a negative impact not only on physical and mental health, but also on attention, memory, intellectual abilities, creativity and time management (Piecuch, 2016; Furmanek, 2014).

Access to the vastness of information on the Internet, closely linked to online teaching, is, on the one hand, an opportunity for continuity of education. On the other hand, it should not be forgotten that, as Cellary (2020, 22) points out, 'the Internet contains everything and denials of everything: what is good and what is bad is beautiful and hideous, ethical and unethical, precious and not, important and invalid'. Jemielniak (2020, 36) argues that 'students participating in online education may be tempted to multitasking—seemingly attending online lessons, while also dealing with other activities, e.g. playing a favorite game or even … nap'.

It is very tiring to participate in online lessons for many hours. The human brain is not adapted to this form of contact with other people. 'Even small distortions of sound or video transmission and the limitation or even inability to observe the mimics or speech of the other person's body require considerable additional perceptual effort' (Jemielniak, 2020, 36; Kaczmarzyk, 2020). It is not insignificant that children—no less than adults—also feel tension and anxiety associated with the threat to their family's health and economic situation, while experiencing helplessness and lack of impact on the situation.

Online learning is associated with risks not only for students, but also for teachers. Of course, like students, and probably even more tired of the situation's social and physical discomfort, they experience anxiety associated with a sense of danger to their lives and loved ones. They are accompanied by a sense of great responsibility, including towards their own students and the parents of the students.

The reports on online teaching in Poland show that 'teachers, especially in the initial period of online learning, experienced understandable discomfort due to a lack of technical competence—they did not know or did not know enough online learning tools and, of course, in this situation did not have the proficiency in using

them' (Kraśniewski, 2020, 46). 'Many of the teachers even experienced a very strong fear of new technologies and new media' (Skowron, 2020, 140).

Another problem for teachers is that in the age of online education there has been a complete blurring of the work-home barrier. 'Many teachers worked while having to take care of their own children, organising care for them on their own, cooking lunches and helping them learn and organise leisure time' (Jemielniak, 2020, 35). What is more, it is well known that working almost all day becomes much less effective or even inefficient. 'The challenge for teachers was not only the transmission of knowledge, but also the verification and evaluation of learning outcomes. And this was recognised as an important issue at every level of education, from elementary to university education' (Kraśniewski, 2020, 41). It should have a form of assessment for learning (Sterna, 2020). The situation of teachers is hardly improved by the fact that at the legal and formal level there is a lack of precise regulation of teachers' duties (Koncewicz, 2020).

In the situation of online teaching, based to some extent on self-searching for information and deciding which is valuable and which is not, teachers face a unique task. Although they have lost their dominant position and are no longer the main source of information, knowledge and skills, they must remain, according to Cellary (2020, 22), a 'reference point and ordering factor' and must help students 'focus on learning what is important and forward-looking, rather than wasting time on what is superficial, though attractively given'. Thus, the teaching profession at every level 'is becoming one of the most changing in the near future' (Cellary, 2020, 22). Paradoxically, the difficult reality that teachers, students and parents have had to contend with every day of online teaching/learning may bring a lot of good in the field of education (Walter, 2020). The pandemic is not only a litmus test of the digital competences of teachers, pupils and the degree of preparation of schools for crisis situations, but also a test of empathy, humanity and ordinary human kindness, and makes them aware of the importance of these values.

The situation of school closures will certainly change the approach of many principals and teachers to the digital school. It will mobilise to retrofit institutions with the right equipment and start a period of real development of the competences for the future in our schools. The experience of online learning can also contribute to moving away from traditional teaching, from lectures serving students with ready-made content in favour of more independent learning, seeking information, selecting it and thinking critically.

Physical isolation from peers could also make us realise how important another person is and how relationships with others are needed and teach us how to take care of those relationships. Perhaps the transition to online education will also lead to a paradigm shift in education and an understanding that education is not the most important core curriculum, assessment or factography, but self-planning and organisation of learning, which can be beneficial for the whole of a human life.

6.2   Research on the Experiencing of UDL Approach Implementation in Online Education During the Pandemic

The subject of the research presented here was one VI-grade class at a public elementary school. The research was conducted during the spring semester of the school year 2019/2020. There were 17 students and a team of four teachers in this class of integrated form, which means that there were some students with SEN included in this group of students. The aim was to simultaneously capture the process of teaching–learning taking place in the examined community, as school education is understood as an interactive relationship between two simultaneous subprocesses: teaching (teacher activity and reflectiveness) and learning (student activity and reflectiveness). Thus, the main focus of the researchers was the course of change that took place in the teaching process—the learning among students and teachers influenced by UDL approach implementation in this classroom (Creswell, 2013; Rose et al., 2005).

According to the assumptions, the research was carried out using the action research method (Szymańska et al., 2018; Szymańska, 2018; Czerepaniak-Walczak, 2014; Pilch & Bauman, 2010; Sagor, 2008). The action research project reported here was launched at the end of February 2020, at the time of the outbreak of the COVID-19 pandemic in Europe, including Poland. The lockdown situation was so surprising that the researchers initially feared that the research project would have to be suspended. While the Polish schools implemented quite quickly various forms of online teaching, it was an extremely difficult situation for all those involved in the education process, from the educational authorities, through teachers, parents and, above all, students, who were necessarily expected in the new situation to be much more involved than ever before in the process of knowledge and skills acquisition.

Our previous experience of conducting a research project on attempts to implement UDL to work in a diverse group of students has identified barriers and positive innovation outcomes to the teaching and learning process (see the previous two chapters). Therefore, it was decided to conduct further studies to identify the conditions supporting the change and its active mechanisms. It was decided that supporting and consulting teachers on strategies to work with students would be based on the implementation of the UDL approach. Research assumptions therefore included the following objectives and problems:

– How do teachers and students show their willingness to change the teaching/learning process and to follow-up changes initiated by the previous experience with a further project and research?
– To what extent do teachers give students choice (purpose, forms of work, ways of knowledge and skills acquisition, including teaching resources and methods, ways of assessing knowledge and skills)?

– How does the relationship between teachers and students and between students and each other change during the course of action (and how does cooperation develop)?

Because of the COVID-19 pandemic and the transition of Polish schools to online learning from the beginning of March to the end of the school year, an additional research problem was formulated regarding the impact of the situation and the forced change in the form of teaching-learning while implementing the UDL approach as well as its effects, that is: In what way and to what extent have teachers and students used their experience and continued to apply the UDL approach to the teaching/learning process during online teaching?

– Did the experience with the application of the UDL strategy have a positive impact on the teaching/learning process in the online teaching period and in what way?
– Were there any difficulties, and if so, what were they with the UDL approach implementation in the online teaching process?

Researchers have only assumed that they will remind teachers about the UDL strategies and encourage them to try to implement these strategies also through online forms of educational efforts.

The content of data collected was analysed due to the constant comparative method (Creswell, 2013). It is applied to identify topics and their specific threads in the data obtained through the research process, which were previously transcribed and encoded.

In order to ensure the accuracy and reliability of the analyses presented below, a communicative validation procedure was applied (Szmidt & Modrzejewska-Świgulska, 2015). It consists of presenting the subjects and threads selected in the analysis process and reconciliation of the interpretations made with them.

It should be noted that the lockdown of Polish schools in the first days of March 2020, in relation to the nationwide lockdown, has never been seen before and proved to be extremely difficult for all entities involved in the education process. One of the teachers described the situation in which the students and teachers, but also the educational authorities, headmasters and the students' parents, were referred to in a direct manner:

Teacher Cecil: *None of us was prepared for this*. (Reflection with researcher, 48)

Nevertheless, the teachers quickly implemented distance education.

Teacher Agnes: *I started to teach through the Zoom platform already one week after school lockdown*. (Reflection with researcher, 46)

Other teachers also used this platform for online teaching purposes. For us, researchers, it was important that online teaching should take into account the assumptions of the UDL approach, although we decided that, in these difficult times, we would not interfere too much with the course of the teaching/learning process, but would limit ourselves to encouraging teachers to continue the UDL

approach implementation in this unusual, online form of work and, as far as possible, we would support them in this respect.

The empirical data, which represent the basis for these analyses, were obtained using the following techniques:

– The survey form—the teachers of Polish language, mathematics and history completed the form that concerned their reflections on the application of the UDL principles in their online classes.
– If the female teachers indicated such a need, they were given individual methodological support on the phone and current problems that emerged in the course of distance learning classes were discussed; such telephone consultations took place at least once a month.
– At the end of the semester, students expressing their willingness were interviewed individually through the Zoom platform to discuss their learning experiences as enriched by the UDL strategies during their distance education.
– Summary focus group interview with the teachers via the Zoom platform was carried out.

The analysis of the data collected in this manner brought the following findings, which, following the footsteps of Cycle Two of action research, were arranged in two phases.

Application of UDL Methods in Distance Education

Teachers, despite the difficulties they experienced in switching to distance education operations, unknown to them so far, continued to try, although—as they themselves admitted not as intensively as before—to carry out the teaching/learning process following the UDL principles.

As part of their efforts, it was important to seek to propose objectives that are understandable to students, and to emphasise their usefulness. Teachers made it easy for students to present the goal(s) of their lessons so that they could consciously participate in the teaching/learning process.

> Teacher Bella: *I explained to them exactly what they would learn and why. They liked the objective.* (Reflection with researcher, 47)

Further, from the students' perspective it is clear that the way of making them aware of the class objectives was clear and transparent. Students' utterances can serve as confirmation:

> Nina: *The teachers at the beginning of the classes said what we would be doing, what we were going to learn.* (Reflection with researcher, 41)Kamil: *Teachers said what we would learn and how.* (Reflection with researcher, 43)

The analysis of teachers' and students' statements leads to the conclusion that in the online teaching environment it was also possible to implement one of the major UDL principles, that is, to present the theory in practice.

Teachers use different forms of action and expression to encourage greater student activity. Thanks to the application of the UDL approach principles, teachers, in order to enrich distance teaching, have sought to offer their students various forms of activity and expression. They have tried to give students, at least in selected lessons, the widest possible choice of ways of achieving the goal or forms of work. One of the female students reports the essence of distance education according to the UDL in the following manner:

Mira: *There were some projects, for example, at maths classes. There were three options to choose from, that is, tasks, for example, crossword puzzle, word puzzle or rebuses.* (Reflection with researcher, 36)

As an example of educational classes conducted in accordance with the UDL rules, the Polish language teacher mentions a lesson about a Polish author of fantasy literature, Stanisław Lem, and its objective was to make a contribution to the development of the Polish language:

Teacher Agnes: *To activate your creativity. The topic was 'We are creative in the world of Stanisław Lem'. I gave them five choices. They were incredibly happy because they could get connected outside the class and work together. And certainly it was not compulsory. They could prepare, they didn't have to, although I encouraged, they could work in groups and they could work individually. … Most of them worked in groups.* (Reflection with researcher, 46)

Another class enriched with the UDL approach also seems to be very interesting, this time history class, which is described by the teacher of this subject as follows:

Teacher Cecil: *They had a choice of three types of Assignment 1. The first assignment was for those who like to count, a bit of maths and a bit of history, the second assignment was for those who like to draw. The students were required to create a historical glossary with the terms we used and to illustrate them. The third assignment involved development of a biographical dictionary. You had to search for some titbits or sentences about selected characters.* (Reflection with researcher, 48)

Thirdly, in accordance with UDL principles, teachers promoted cooperation as a form of supporting commitment. It turned out to be very important to respect another UDL principle, namely to promote cooperation, perceived as such a form of in-class work. Distance, also, most effectively supports students' commitment.

Mira: *You could do something on your own or to team up with someone. I chose a group, because then you can help one another and learn the most, and it is more fun.* (Reflection with researcher, 36)

The students worked together mainly via the Zoom platform. One student reported in detail on the form of collaboration related to distance teaching enriched with the UDL approach: 'We held the meetings via Zoom platform. We set the time of meetings and I, for example, would send a link'. To the researcher's question: 'How big were groups that you formed?' the female student explained:

Mira: *Any size that we wanted. Usually four persons. We work together a lot*. (Reflection with researcher, 36)

Joint work via a distance teaching system based on the UDL principles was an opportunity to learn compromises. The following statement can be used as an example here:

Kamil: *We decided together how we would do it. We would come to a consensus how to do it. Then we voted*. (Reflection with researcher, 43)

Having no option for direct contact made the students aware of the value of community, which is documented in their reflections as follows:

Mira: *Actually, we've become more fond of each other; everyone wants to know what's going on now*. (Reflection with researcher, 36)

Meetings via instant messaging were not only related to learning itself, but also satisfied the need for social contact between the surveyed teenagers.

To the researcher's questions: 'Do you miss one another?' the students answers were positive. The following statement of a female student can be used as an example here:

Mira: *Yes, very much! And from time to time we arrange to meet via Zoom platform. Frequently*. (Reflection with researcher, 36)

The teachers of the surveyed class took care to maintain the feeling that students belonged to one community. An interesting idea that the students liked very much was a class during which they browsed through the photos taken during school trips.

Teacher Cecil: *It followed 'let's experience that once again' principle*. (Reflection with researcher, 48)

During online teaching, not only was cooperation between students very important, but also cooperation between teachers and students, which, in the case of the class under examination, as the analysis of the material obtained during the research shows, went far beyond the formal framework. Students could get in touch with the teacher whenever they needed his/her assistance.

Kamil: *There was an option to hold one-to-one meeting with the teacher, if his or her assistance was needed.* (Reflection with researcher, 43)

Teacher Bella: *I would also get connected with kids in the evenings.* (Reflection with researcher, 47)

The students' needs for cooperation and contact with others varied from one case to another. In any case, the teachers approached the students on an individual basis, accommodating those who had the need for more intensive contact.

Teacher Bella: *N. wrote, rang me and she really needed that kind of attention and contact. Well, I worked a lot with her, we solved problems together, we also talked on the phone*. (Reflection with researcher, 47)

Positive experiences related to tutoring (teachers' and peers') meant that, despite initial concerns about the value of distance education, it was possible to achieve its

objectives, and with regard to some students, the distance teaching performance turned out to be unexpectedly good. Teachers had a very positive opinion of distance work in the surveyed class, as evidenced by the following quotations:

> Teacher Bella: *Class VI passed the exam very well, because I can compare it with another form of course. I'm impressed with our children attending Class VI. … In-class work was fun. Children worked, volunteered to answer questions. They always switched on their Web cameras. … I'm impressed with our children attending Class VI.* (Reflection with researcher, 47)

Probably among the reasons for this is the fact that students were able to learn 'on their own terms' to a much greater extent than before, which goes hand in hand with the philosophy of the UDL.

> Lena: *There was more time for tasks. It was more comfortable because it was at home. No need to get up so early. More time for writing.* (Reflection with researcher, 37)

Teachers also maintained very good contact with the parents of students at all times, realising how difficult the situation of parents has become in relation to the transfer of students' education venue.

> Teacher Cecil: *I was up to date with them (parents), actually 'on the phone', because these calls appeared quite often. … We were on the phone all the time, whatever happened, these parents practically called me at least two to three times or even more during this period; they called and talked to me.* (Reflection with researcher, 48)

Thus, online education during a pandemic would not have a chance of success if it had not been for the close cooperation between teachers, students and parents, and primarily among students. The experience of cooperation makes students aware of its value, which is a kind of capital, which hopefully will be taken advantage of in the future. A positive assessment related to the experience of cooperation in a group caused students to declare that after resuming their education at school they would try to cooperate with each other as much as possible.

> Lena: *More workgroup.* (Reflection with researcher, 37)
>   Kamil: *I want to work in a group, because it is easier.* (Reflection with researcher, 43)

When participating in online education, teachers and students necessarily used modern teaching aids in their work, which is consistent with UDL principles. Interestingly enough a kind of paradox emerged during interviews, both with students and with teachers. Students became bored with free access to modern technologies after some time and then started to reach for books in the traditional (hard copy) format, which, according to researchers, is a positive phenomenon, and although it seems that it is not entirely in line with the UDL principles, it can be described as 'everything old is new again'.

> Teacher Cecil: *You had to look for it in the textbook, you had to look through it, because some people, I suppose, often don't look through it (they didn't look through it before), and here … you had to work with the textbook in this manner clearly. I think it's good, because sometimes I feel like we hand them everything on a plate. … I remember my education in such a manner that it was me who was looking for myself and it was me who was flicking*

through the textbook. So I think it's good, and it's worth continuing sometime. (Reflection with researcher, 48)

Thus, the online work forced students to search for information on their own in a conventional, but valuable source: a school textbook.

Positive Impact of Previous Experience with the UDL Approach on Online Education

In the online teaching period, previous experience of teachers and students related to the UDL approach implementation in the teaching/learning process had a positive impact on the educational, but also social aspects of the functioning of teachers and students.

The analyses carried out make it possible to conclude the maintaining of a high level of motivation and commitment to continuing a fully-fledged learning process—learning in the times of online teaching. The researchers' tracking of the reports (Pyżalski, 2020) evaluating online teaching in Polish schools makes it possible to conclude that the teachers participating in the project belong to the group of those who made great efforts to continue teaching and fully implement the curriculum despite the schools lockdown. This certainly involved a great deal of work, but as the teachers themselves stressed, their sixth-grade students demanded activity and tasks consistent with the UDL approach.

Teacher Dalia: *At our school, all classes were organised and all the extra and compensatory hours, and all those divided into groups. Actually, they had plenty of it. They were willing to participate in it.* (Reflection with researcher, 49)

Teachers also have a very positive view of the students' commitment at the surveyed class, as the students participated systematically and actively in the in-class activities.

Teacher Cecil: *Generally speaking, the online classes were characterised by a very good attendance rate. With one exception, the remaining children, I am talking about the whole class, participated in these classes very systematically … An advantage for us was that these kids showed via web camera and were visible in a window, because we have a comparison with other forms, so it's much easier and more enjoyable to work when I see a kid. Then, for example, at a secondary comprehensive school, where we don't see anyone and talk to the screen and the response is so weak. Meanwhile here we had dialogue, the exchange of opinions, and it was easy to work because these children were visible.* (Reflection with researcher, 48)

One of the teachers directly defined the students' willingness to learn by saying:

Teacher Bella: *They all brought themselves to learn so hard.* (Reflection with researcher, 47)

The students' involvement, their mobilisation and willingness to learn online were certainly linked to the commitment of the teachers, who swiftly implemented the online classes and held them in a very reliable manner.

Teacher Bella: *And they had so many online classes that sometimes I already counted: 'oh, they already have five, so I can't report the sixth one (to the headmaster)'. Because the headmaster said that five online classes was maximum and one should not exceed this daily threshold. In our case we went in the opposite direction. We had so many distance educa-tion, that we had to watch not to have too many of them.*[1] *Yeah, I think we were all trying very hard at this point.* (Reflection with researcher, 47)

In their utterances, the teachers also compared the Class VI covered by the proj-ect with other forms and emphasised that the students in Class VI showed above-average performance and worked with high commitment.

Previous experience in enriching the UDL in the learning process has resulted in an increase in the development of students' skills involving planning, organisation and managing their own learning process. The lockdown created an opportunity for students to become more independent, including making decisions on their own. Especially in the initial period, it was not easy, but with time it turned out that the students were doing well. Despite the initial hardships, students became more and more independent.

Teacher Bella: *Initially there was also a problem with connections. Mom (of H student), before they came to the conclusion that H should also work independently. Later H learned beautifully how to work independently, really. But at first he was scared, and his mom was scared. His mom worked, he was alone. Yeah, the organisation was tough at first, but then it all came out beautifully. After some time H sent everything beautifully on his own, I was impressed. … I asked the other children each time at the beginning whether Mom helped to send (online tasks), whether Dad helped to send or whether they sent on their own. Later on they boasted themselves that they could do a lot of things on their own.* (Reflection with researcher, 47)

Teacher Dalia: *Online teaching taught them to work so independently.* (Reflection with researcher, 49)

In turn, a female student reports on the development of her independence through the online learning process in the following manner:

Nina: *Now I had to be more independent, to take decision about timing and what to do (the researcher's question: 'And what happened? Did you succeed?'). Yes, I did.* (Reflection with researcher, 41)

This observation is shared by teachers, who note that for many students, even those with greater difficulties in their daily lives, distance education is conducive to plan their learning and organise their education.

Teacher Cecil: *Some children have learned to organise their time and to plan. Our parents told us that even children with medical certificates, here is the example of a student with Asperger's syndrome. At the beginning it was just one big mess, no organisation at all, he got lost, he didn't know how to attack this problem and only when he grew to the new*

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[1] The school ran lessons in various forms, and distance learning classes (online webinars) were only a part of them. The decision on the form of classes was made by the teachers. Students attend-ing Class VI had their classes delivered mainly in this way. The school management warned the teachers not to expose the students to 'digital overload'.

environment, he opened some kind of notebook on his PC. (Then) he would send the assignments back on time, he would connect regularly. (Reflection with researcher, 48)

Teacher Bella: *There were students who started to work much nicer under the online teaching system than at school. There were people like that and I was so surprised … they said that they were more motivated by online learning … there were people who really developed wings.* (Reflection with researcher, 47)

Teacher Bella: *At the end of the day, she did that systematically … There were people who were helped so much by this, they mobilised themselves to work and also believed they could do it.* (Reflection with researcher, 47)

Some teachers associated the observed change directly with the reduction of their dominance in the teacher–student relationship, because in online teaching additionally enriched with UDL principles, the teacher's role becomes less dominant. One of the teachers put it bluntly:

Teacher Agnes: *Well, I was kind of a mentor.* (Reflection with researcher, 46)

The students accept an increase of their roles in the teaching/learning process:

Lena: *Teachers told us what problems we had to solve and we had to organise it ourselves.* (Reflection with researcher, 37)

It seems that, thanks to previous experience with the UDL approach, there has also been a noticeable change in the development of independence, responsibility, creativity and problem-solving skills of students. Evidence of the responsible involvement of students in the teaching/learning process occurred through support for other colleagues, or even a teacher, when help was needed to deal with IT tools at a distance.

Teacher Agnes: *The class behaved very nice, they helped me very loyally, because they know that I am an IT loser. And L would simply say: 'Madam, you click here, you click there'. I did it and it always worked.* (Reflection with researcher, 46)

One of the teachers revealed the mechanism of awakening students' responsibility and moving from external to internal motivation:

Teacher Bella: *Those who didn't want to connect, didn't want to solve problems, we didn't punish (with bad grades). I even rebelled at the beginning when the headmaster said 'don't give any Fs'. Well then … let it be their business, we ask them, we admonish them and so on and so forth, but (the point is) that they should feel responsible, they should see the difference now. It's harder now and it's on their shoulders now.* (Reflection with researcher, 47)

Importantly, the level of their self-awareness and self-esteem is also growing, which was confirmed by the following statement made by a female student, who was previously known as a girl having problems with ADHD, finding it difficult to concentrate on other people's statements and demonstrating low activity during classes.

Lena: *It's for sure that I'm more thorough now, because I'm giving up the problem now and (here the question confirms) I have such a feeling that this is my responsibility.* (Reflection with researcher, 37)

As a result of the UDL approach implementation, students' creativity also increased under the online teaching system. This is testified to by the following statement:

Lena: *We shared tasks. At maths classes you could do a mathematical crossword puzzle, or there was a rebus or some kind of riddle. It's faster, there are different ideas. Everyone submits their idea and then we proceed to vote.* (Reflection with researcher, 37)

Reasons for the Limited UDL Approach Implementation Under the Online Teaching System

Although teachers clearly perceived the benefits of using their previous experience of UDL approach implementation in the teaching/learning process during the difficult times of online teaching, which has a positive impact on the learning community, they acknowledged that they did not apply the UDL approach as often as it was intended during the past semester.

Among the reasons for the limited implementation of the EDL strategy in online teaching, the teachers pointed out, among other things, were the technical issues that had to be addressed when switching to online teaching. The situation was particularly difficult at the beginning when teachers and students had to master online tools, but in hindsight, the self-esteem of teachers and students was clearly positive in this respect.

Teacher Bella: *None of us was prepared for this. So I think we mastered these technologies quite quickly and, well, it wasn't easy for everyone. For us, too, it was stressful before we got to it*. (Reflection with researcher, 47)

It is important to realise that in the process of distance education, objective technical obstacles, such as lost connections due to Internet congestion, appeared more often at first and then fortunately less frequently. In every house, children learned and their parents worked online, so at the same time, the Internet was used intensively by many people. It was an important obstacle to education in general, and in the teaching/learning environment reinforced with UDL strategies, that is, more diverse in nature, it could be a very important obstacle.

Nina: *Unfortunately, during classes frequently Internet lags occurred (in the sense that students were disconnected from the Internet).* (Reflection with researcher, 41)

Still another problem, also related to technical problems arising in the situation of non-direct contact, is the difficulty of discussion, which is inextricably linked to the UDL approach.

Teacher Bella: *If the group was preparing a task, everyone wanted to speak simultaneously. It was four or three people… And suddenly at the place of one of them, for example, a mixer or a vacuum cleaner is on, or there is a renovation activity behind the wall … It was difficult to report in groups what they had worked on out there*. (Reflection with researcher, 47)

The difficulty that the students noticed was also the lack of direct contact with the teacher, who could not—as was the case in traditional education—provide an immediate response to the difficulties or at least dispel doubts experienced by the students.

> Nina: *Previously, we had more exclusive contact. We had more chances to ask the teacher for help, for example, to verify some assignment, to give directions somehow, and with this on-line teaching, it was hard to respond immediately in this manner. It was easier at school.* (Reflection with researcher, 41)

This is confirmed by the words of teachers who, in an online communication environment, were deprived of the typical tools of keeping disciplined students who were not focused on the course of the lesson.

> Teacher Cecil: *I felt that I had less power over them … Reduced capabilities.* (Reflection with researcher, 48)

The lack of direct contact meant that the teacher had a limited repertoire of strategies for disciplining students, though not only was he himself not helpless, but he also experienced support from other students.

> Teacher Bella: *Sometimes we applied mute someone in the class, but this is a great tool, really.* (Reflection with researcher, 47)

In the absence of physical, direct contact with students it is difficult to control housekeeping arrangements. One of the teachers even calls it organisational chaos.

> Teacher Cecil: *They liked to talk (a lot) during these classes (UDL enriched), it was getting chaotic, after all at such class at school it is easier to master situation.* (Reflection with researcher, 48)

In the statements of individual students, there is another reason for difficulties in the distance education system, including working according to the UDL principles. Some students during the early days of the distance education era played their favourite games on smartphones or distracted others by drawing some humorous remarks or drawings on the desktop (blackboard) provided by the teacher.

> Kamil*: We were disturbed by the classmates playing games during classes.* (Reflection with researcher, 43)

Interestingly enough, the sense of responsibility for the group encourages students to discipline one another.

> Teacher Agnes: *When someone made doodlings on the board, although I learned later where to block it, still they yelled (at one another).* (Reflection with researcher, 46)

The analyses also revealed objective difficulties caused by the pandemic situation. Both students and teachers also pointed out that some forms of work, and those in which the UDL principles are 'natural', became completely unavailable:

> Nina: *Most of all, we miss school trips, performances.* (Reflection with researcher, 41)

The teachers agreed with the students. An example is a statement made by one of them:

Teacher Bella: *If there was a school, we would go to the cinema, we would make outings here and there, under current circumstances it was impossible. They had classes day by day.* (Reflection with researcher, 47)

This is what, according to the teachers surveyed, made the students—especially at the school year end—less eager to work creatively.

Teacher Bella: *They were already tired … they had enough of everything, they had no power for some interesting ideas, they were simply exhausted.* (Reflection with researcher, 47)

Among the reasons for holding classes, in a more directive way, without respecting the UDL principles, where the teacher takes a dominant role and imposes on students the work type, methodology and form, the teachers continued to point out a need to implement fully and completely the overloaded core curriculum.

Teacher Agnes: *I had to rush with the core curriculum.* (Reflection with researcher, 46)

Teacher Agnes: *I had a few more ideas, but due to time constraints, I didn't implement all of them. … I am lagging behind with curriculum execution. … The curriculum is extensive and I wanted to execute the most by the end of the year. … And I look at it this way: I still have so much to do, and the end of the year is round the corner … I had a few more ideas, but due to time constraints, I didn't implement all of them.* (Reflection with researcher, 46)

Thus, the teachers, despite numerous interviews with researchers on this topic, continue to harbour the belief that holding classes in accordance with the UDL principles would not allow them to execute fully the entire curriculum, which they consider to be a prerequisite for reliability and effectiveness of their work. The operational model developed over the years and imposed by the educational authorities makes them unable to accept the idea that giving more freedom to students to choose the content, method and form of work can be much better for students and can have a positive impact on the actual level of their knowledge, skills and social competences rather than execution of the entire curriculum, of which there is often little left in students' memory.

6.3   Discussion and Conclusions: New Experiences in the Teaching-Learning Process Under Implementation of UDL Approach in Online Education as Steps Towards Inclusive Education

Summarising the analyses concerning the results of action research presented in this chapter, several conclusions can be drawn.

First of all, in the difficult period of the pandemic, teachers and students used the previous experience they gained in implementation of the UDL strategy in the teaching and learning process. Although, as they themselves noted, they did not do it as often as they did in the conventional form of school teaching. Nevertheless, the teachers made every effort to set goals in a way that was as comprehensible as possible for the students and so that the students could see their usefulness and an

option of using the acquired knowledge and skills in their own lives in the present and in the future. Although the lack of direct contact made this task difficult, the teachers strived at translating the theory into practice and the students at using the knowledge and skills acquired during the lesson in their own practical activities.

Moreover, the teachers tried to give the students the opportunity to choose various forms of action and expression. As the teachers admitted themselves, this did not happen in every lesson. This fact proves that the UDL approach implementation is an ongoing and incomplete process that, in order to develop, requires constant, although less and less intensive, methodological support. An important factor stimulating this process is that teachers themselves see that giving their students an opportunity to select different forms of action and expression clearly breeds higher activity and involvement from students. Students appreciated this very much and willingly used the choice offered to them.

A key aspect, and at the same time the primary value of the teaching/learning process that is inextricably connected with the UDL approach, turned out to be cooperation, especially in the time of distance learning. This took place in various dimensions. Thus, it was a cooperation of students with one another, cooperation of students with teachers, as well as cooperation of teachers with parents. The analyses carried out allow us to conclude that this cooperation took different forms, depending on the needs of students, teachers and parents. Students willingly formed a cooperative community not only during the lessons but also after school.

Teachers promoted this collaboration as a form of supporting student engagement. The above-average openness of teachers to contacts with students should be appreciated. Almost any time outside classes students had the opportunity for group or individual contact with the teacher. Good contact between teachers and parents was also crucial, as the latter experienced various difficulties in moving a student's education setting and meeting barriers in his/her social and peer interactions. Thus, the close and constant cooperation of students, teachers and parents, one of the key principles of the UDL approach (Meyer et al., 2014; Rose et al., 2014), proved to be a key success factor of the distance learning process.

Secondly, the analyses show that the previous experience of teachers and students in the implementation of the UDL approach in the teaching/learning process has had a positive impact on the quality of distance teaching and learning. The UDL approach kept teachers' and students' motivation at a high level to continue the teaching/learning process online. Taking into consideration the results of the reports on the overall education in the initial period of the pandemic with the associated lockdown, it should be noted that primarily, the teachers surveyed, but also their students, made every possible effort to ensure that the teaching/learning process did not lose its value.

The analysis of the narrative material collected in the course of the research enabled us to conclude that the situation in which the examined class and its teachers functioned not only did not cause any limitations, but on the contrary, it also partly contributed to the development of students' skills in planning, (co-)organising and managing their own learning process.

Handing over a higher degree of initiative to the students, partly due to the conscious decision of the teachers who had been guided earlier by the UDL approach, and partly forced by the lack of direct contact between teachers and students, turned out to be a factor that fostered the development of the independence, responsibility, creativity and problem-solving skills of students.

All this was done in an atmosphere of teachers' high responsibility for teaching, but also students' responsibility for their own and their group's learning outcomes. Particularly interesting and worth emphasising is the development of mutual support (peer tutoring) among students.

While identifying and appreciating the positive transformations in the teaching and learning process that took place, it should be noted that the material collected during the research also includes a topic concerning the reasons for the limited implementation of the UDL approach in distance education. This limitation was mainly related to the dimension of offering students an opportunity to choose various forms of action and expression in every class. Among the causes of these difficulties, the teachers pointed out first of all the technical problems experienced, especially in the initial period of shift from conventional to distance education.

These resulted from inconsistent quality of the Internet connection, which was associated with its overload or with the fact that teachers and students had just begun to use various new distance learning tools. For instance, it became difficult to hold an in-class debate because holding it via a video connection is not as smooth and natural as during direct contact between teachers and students in the classroom. The lack of direct 'live' contact also hampered quick responses to the dynamically evolving needs of students during classes.

Teachers also pointed out that in the situation of distance education they felt deprived of the typical tools used to discipline students, who during classes, for instance, did not focus enough on the content discussed. It should be noted that under such circumstances, the teachers could count on other students who disciplined one another upon their own initiative. The teachers' and students' statements also document objective difficulties in the implementation of the teaching/learning process related to the duration of the pandemic. It is therefore not possible, for example, to organise trips or outings to cultural institutions or other places, while outdoor learning is perfectly compatible with the UDL approach (Meyer et al., 2014).

A cause for some concern is that some of the difficulties have persisted almost from the beginning of the action research project in the selected class. Difficulties remaining include, primarily, teachers' fear of not being able to teach 100% of their curriculum on time. Teachers still show a belief, even though it is much weaker than in the previous research (see Chap. 5), that UDL approach-based teaching is more time-consuming and therefore will not allow them to teach fully the entire curriculum, whereas they are convinced that this is a prerequisite for their work reliability. Gradually, however, it can be observed, especially among younger teachers, that their mindsets begin to change and they understand that education is not about teaching the entire material, but about educating the students to develop those features which, in a dynamically evolving world, will enable them to pursue their

lifelong choices, acquisition and updating of knowledge, responsibility and independence and the ability to cooperate with others.

It is worth noting that the process of change that has been shown is also subject to a variety of situational factors. In the case of this project, the COVID-19 pandemic turned out to be such a factor, which radically influenced the shape of education in general. The change taking place in this extremely different reality was threatened, but paradoxically, the difficult situation has had a positive impact to some extent on changing the teaching/learning process in the surveyed class. As the teachers and students emphasised, this happened exactly because the changes had been initiated and implemented earlier.

The situation in which education has been found itself during the pandemic has posed a number of challenges for teachers, pupils and parents. As Lubacz notes (2020, 5), 'teachers and learners have mastered the technical side of teleinformatic tools relatively quickly', but this is not the only problem of online learning. Particular attention should be paid to the quality of teaching relationships with learners and between learners.

One of the most effective strategies for developing and improving the individual and social competences of each student, and in particular those with special educational needs, is group work (cooperative learning, collaborative learning). The essence of group work is:

– Partnership—coordination of entities.
– Interdependence—all members of the group strive to achieve the group goal and help each other to achieve the individual goals.
– Individual responsibility—each member of the group is responsible for their own learning, which in turn helps to achieve the group goal.
– Cooperation—students discuss and solve problems and cooperate with each other.
– Pro-social attitude and humanism—helping, support, solidarity, altruism.
– Evaluation—the members of the group check the results of their work, evaluate them and make the necessary changes. Education in cooperation has clear pro-inclusion qualities (Bąbka & Korzeniowska, 2020).

The basis of group work is joint work on the task, connected by a network of communication relations between the members of the group. Communicating with each other not only allows exchanging thoughts, ideas and solving tasks/problems, but also allows:

– Creating active knowledge, for example, that which creates the student's cognitive patterns. It is in the process of work that the student tries to say/name what he/she saw, or did, or what he wants to do or wants others to do.
– Creation of operational knowledge—which is used practically in different life situations.
– Developing organisational skills—initiating activities, stimulating activity, planning and coordination of actions.

It is worth noting that in the process of group work, students support themselves in learning from each other. The motivating of students for cooperation and the

arrangement of their work in diverse teams is in line with the key principles of improving the quality of education (EADSNE, 2011).

A teacher working in an inclusive classroom must not only work with students, but also with their parents in order to fully carry out their tasks. Until the pandemic, parents had never been expected to 'enter the role of educators of their children' (Amilkiewicz-Marek, 2020, 129) on such a large scale. This matters to every student, but it is especially important for students with special educational needs. This cooperation must not be ad hoc and must not be limited to 'mutual information about the child, his behavior and learning progress, but should cover at full scope all the child's needs' (Plichta, 2020, 71).

The well-run cooperation of the family with the school is one of the basic tasks to be fulfilled by the modern school. Working with parents is a kind of support for them, which can take various forms including: class fanpage, electronic journal, SMS, phone calls or emails. Thanks to this, parents participate directly in the teaching process. The interaction of these two environments guarantees the proper relations between the teacher, parents and the student, which are necessary in the child's learning process and, above all, necessary for their proper development. It is therefore desirable and appropriate for parents to actively participate in the education of their children, to co-decide on the course of their children's teaching and learning process (Pawlak, 2003).

Relationships between teachers can take on different dimensions, but in integrated education and inclusive education it is necessary to open teachers to constructive cooperation with different people. Thus, the professionalism of teachers and the duty to provide the highest quality of education for all students requires that they have strong affiliation tendencies and that their relationships in the context of interpersonal communication concern both dominating behaviour (such as initiation, coping, conduct, coordination) and dependency (approval, support/help, cooperation, commitment).

It is to be hoped that—as Poleszak and Pyżalski point out (2020)—the situation of the pandemic will become an opportunity to build better relations between teachers and parents. The experience of the pandemic has clearly made this clear, but we often forget how important teachers are to the quality of education. In Polish schools, there was a huge variation in the way online classes were organised and conducted. This differentiation was linked to a number of different factors. However, this is not just about technical facilities, the quality of Internet access or teachers' digital competences. Equally important, if not more important, seems to be the involvement and methodological skills of teachers, as well as their flexibility, openness and willingness to seek new ways of organising the teaching and learning process. Preliminary assessments of the course of online learning in the school year 2019/2020 reveal that these teachers, who were also involved in genuinely supporting the development of their students before the pandemic, those who had already given students a choice, promoted their cooperation and tried to ensure that students understood the goal and saw the usefulness of the knowledge and skills acquired in the educational process. The teachers we investigated while they were implementing the UDL approach certainly belong to this group (Mach, 2020).

An important change has also taken place in students' learning activity and their personal competences. Those who were taught, they became those who learn for themselves. They became (because it is certainly not a completed process) persons who are able to select and critically evaluate information and think about it briefly. Education during the pandemic has therefore proven to be an opportunity to increase the independence, capacity and creativity of students. Students 'moved' when teachers 'paused' (Ścibor, 2020, 59).

The results of the action research described in this chapter confirm the effectiveness of the UDL and the benefits of applying this philosophy (because this is how we ultimately understand UDL) in working with diverse learners, both for educational and social development. As in the sources mentioned above, it has been illustrated that the UDL contributes to reforming the learning process, optimising it and creating favourable conditions for inclusion. It should be noted, however, that the adopted research assumptions focused researchers' attention on only selected aspects of the learning process. Reflection on the results obtained and the phenomena observed in the course of collecting empirical material stir new questions and open up a further perspective for research on the implementation of the UDL approach in everyday school work.

The reflections presented here are merely a prelude to the necessary discussion on how, despite online education, to not only maintain, but also to develop, the idea of inclusive education. The question of what promotes the optimisation of online education is so well-established that, probably even after the pandemic, 'the world will no longer be as we know it' (Lubacz, 2020, 5). In addition, after a period of expected returning to a new normality, it is worth taking advantage of the positive experience of online education and partly linking it to traditional education within the walls of the school.

Interestingly, it is noted that the COVID-19 pandemic period 'astonishingly shows how topical the question of teaching forms is, as their advantages and disadvantages were formulated two thousand years ago' (Bartol, 2020, 9). This is a dispute between ancient philosophers initiated at that time, related to two different models of knowledge transfer. Plato claimed that the only valuable form of contact between pupils and teachers was direct contact and oral communication, whereas Socrates approved written texts that also made it possible to contact another person's mind without the need to meet him in person. The long history of education has shown that both of these models of knowledge transfer can perfectly coexist and complement each other. It will probably be the same, after the pandemic has ceased, with at-school and on-line education:

It seems that in education after pandemic, as always and everywhere, the ancient principle of the golden means will work. A non-reflective, theoretically possible at almost all stages of education, moving into the virtual world would dehumanize not only the teaching process itself, but also all of us. On the other hand, a stubborn and complete rejection of the skills and experiences acquired in an emergency would be proof of our carefree, misunderstanding of the challenges posed by the modern world, and, finally, of intellectual laziness, so as not to say limiting. The most productive, interesting and most alluring is what is varied, which gives us the opportunity to choose what uses proven long-standing patterns

while using the latest ways of coping in the world being created in the time of advanced technologies. (Bartol, 2020, 12)

Referring to the thoughts of ancient philosophers, as well as referring to the results presented in this book of action research, one can afford more reflection. UDL-based online learning in the early stages of the COVID-19 pandemic periodically contributed to sustaining the teaching-learning process. A high level of motivation of teachers and students to develop and continue in online lessons as a full-fledged teaching-learning process was observed. It allowed for the maintenance of an effective cooperation between teachers, students and parents and between students. There has also been noticed an increase of student skills in planning, organising and managing the process of their own learning, as well as the development of their self-reliance, responsibility, creativity and problem-solving skills. As a result, they have become more active (self-learning improving). Teachers, on the other hand, took on the role of facilitator; they tried to create optimal conditions for the teaching-learning process in this diverse group of students. The general changes were thus conducive to implementing the basis for inclusive education.

On the other hand, it should be made clear that the protracted period of online learning associated with the unexpectedly long duration of the pandemic[2] poses a real threat to the teaching-learning process and inclusive education. Teachers, pupils and parents feel tired of such a prolonged period of crisis and all of them want the return to education based on direct contact between teachers and pupils in a school building.

When considering the future, it is worth noting that the UDL philosophy can prove to be a very useful tool after coming back to education within the walls of the school. It is important to be aware that students will require a number of innovative actions in order to learn to be together again and to work together. Further, teachers will need to create synergies and build on the diversity of the learning community as well as on the educational process. In order to meet this extremely difficult task, everything should be done to ensure that the educational environment is organised in the most universal and optimal way (based on UDL principles), so that students and teachers re-learn to function in the school reality and so that students who, after the pandemic period, seem to have even more diverse needs, have access to and can participate in re-creating the school community, and this is a challenge for live inclusion.

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[2] At the time of submission of this book for printing, the third semester of education took place in an online form.

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Chapter 7
Development of Knowledgeable and Resourceful Learners

Alvyra Galkienė and **Ona Monkevičienė**

Abstract This chapter introduces a study carried out in the context of the transformation of the Lithuanian education system towards inclusive education, with the aim of revealing the educational factors that contribute to students becoming knowledgeable and resourceful expert learners in the universal design for learning (UDL) approach. The UDL framework was chosen as a systematic reasoning instrument for the teacher and the school, aiding in achieving the development of expert learner qualities in every student in the general education context and ensuring the quality of inclusive education. The chapter briefly introduces the theoretical approach of the research, the context of Lithuanian education and the school where the research took place, which is relevant for the interpretation of the results, and other important methodological aspects. The research data show that applying the UDL approach helped the teachers to modify the educational process in order to develop in students the qualities of knowledgeable and resourceful expert learners. The results, presented in a structured manner in the chapter, reveal the process and contributing educational factors to students' becoming actively perceiving, self-directed, knowledge-creating and co-creating learners and learners constructing their own deep comprehension. The research data reveal the methods used by the teachers to recognise and overcome the barriers in cultivating these qualities in their students. We also identified the emerging changes in teachers' dispositions when applying the UDL approach and designing lessons aimed at promoting the qualities of knowledgeable and resourceful expert learners.

Keywords Inclusive education · Universal design for learning · Learning barriers · Self-directed learning · Knowledgeable and resourceful learner

A. Galkienė (✉) · O. Monkevičienė
Educational Academy, Vytautas Magnus University, Kaunas, Lithuania
e-mail: alvyra.galkiene@vdu.lt; ona.monkeviciene@vdu.lt

7.1 Introduction

The concepts and practices of individual inclusion and inclusion for all have been competing in the educational systems of many countries (see Chap. 1). The approach of individual inclusion is beginning to prevail, particularly when referring to the student's achievements and role in the process of their own learning. Students, especially those with SEN (special educational needs), are frequently acknowledged as passive subjects, lacking any active, self-directed or deep learning power from the perspective of the roles and responsibilities of teachers and students. Having failed to eliminate the barriers related to this aspect and the practical organisation of education, schools have not achieved a higher level of inclusivity in education based on inclusion for all. In this connection, some research studies have shown that educational practices can be changed by applying the UDL approach (Meyer et al., 2014).

The UDL is closely linked with constructing a flexible educational environment, which is accessible to all students (Meyer et al., 2014) and the formation of scaffolds when students need support (Sanger, 2020). In the UDL concept, the diversity of students is understood in its broadest meaning—different processes of information perception and its use are characteristic of all students (Rapp, 2014). The nature of students' differences predetermines the variety of education modelling. The application of the UDL principle 'Provide multiple means of representation' (see Chap. 1) establishes conditions for students to become familiar with information, perceive and understand information and construct knowledge. A flexible curriculum, means, application of information technologies promotes a better understanding of read texts (Brand & Dalton, 2012) and visualised narration (Cohn, 2020), which serve as scaffolds for information accessibility and the management of cognitive processes in cases of dyslexia, autism spectrum and other disorders (Rosita et al., 2020; Wainwright et al., 2020; Hartmann, 2015; Meo, 2008).

A knowledgeable and resourceful expert learner distinguishes themselves by the active perception of information and its transformation into deep knowledge (Meyer et al., 2014). The active and deep processing of new information focusing on meaning and the interconnections of texts, ideas, structures and integral relations, the use of higher cognitive strategies for the analysis of perceived information from different perspectives and its reconstruction, the linking of new knowledge with previous knowledge and reflection on ones' own learning are typical of expert learners (Marton & Saljo, 2008; Bran, 2014; Golightly & Raath, 2015; Asikainen & Gijbels, 2017; Samuels-Peretz et al., 2017; Peng & Chen, 2019). According to these researchers, the interaction between the strategies of information perception and reorganisation and intrinsic motivation are needed for the creation of personal deep comprehension. The expert learner has to possess an expressed intention to understand and be engaged in the creation of their own knowledge (Golightly & Raath, 2015).

Deep personal comprehension is more successfully constructed by self-directed students. The process of self-directed learning embraces the student's learning initiatives; the student takes responsibility for the development of their own

comprehension, demonstrates self-management of cognitive processes, recognises their own unique strengths and needs of developing their knowledge, set personal goals for the development of understanding, employ various information sources, choose the most acceptable and efficient learning strategies and self-evaluate learning outcomes (Salleh et al., 2019; Walt, 2019; Yang et al., 2020). Self-directed students use meta-cognitive, cognitive and social strategies of autonomous learning, such as searching for information, reorganising it, discussing key ideas in the learner group, creating new meanings, reflecting and others (Koc, 2019; Kim et al., 2019). Previous research has also shown that a self-directed student easily adapts to different learning contexts, such as face-to-face or distance learning (Houston, 2018; Kim et al., 2019; Yang et al., 2020; Lasfeto & Ulfa, 2020). The teacher assumes the role of a moderator and creates learning environments, foresees procedures and points out possible ways for students to construct their own understanding (Walt, 2019; Kim et al., 2019; Sukardjo & Salam, 2020).

As a knowledgeable and resourceful learner, the student possesses the ability to not only create personal knowledge but also efficiently become involved in the collaborative co-creation of knowledge. Poyry-Lassila et al. (2017) and Santosa et al. (2020) distinguished three necessary conditions for collaborative co-creation: a shared space for contact or online learning, a group of actively learning students and shared objects (ideas, experiences and sources of knowledge). The creation of shared knowledge occurs when students discuss with each other and with the teacher, exchanging already possessed or newly found information and sharing learning strategies. Heterogenous groups are more favourable for the co-creation of shared knowledge (Gratton, 2019). However, a positive interaction among all the students is necessary; teachers should use scaffolds that facilitate students' learning of the strategies of collaboration and co-creation of shared knowledge (Moore et al., 2020).

In Lithuania, just like all over the world, the goals of education system are set by taking into consideration students' different needs and the possibilities of the teachers to educate and develop a self-directed learner—that is, one who is able to individually construct deep authentic knowledge and act in collaborating teams (in other words, to educate knowledgeable and resourceful expert learners) (UPK, 2016). The Lithuanian National Strategy for Education for 2013–2022 (National Education Strategy 2013) set the goal to increase the accessibility of education and ensure the development of equal possibilities for all. However, the implementation of these objectives has not brought about the anticipated results so far and requires more considerable attention from researchers, educational policy-makers and practitioners. The results of the Programme for International Student Assessment (PISA) 2018 (OECD, 2019, Vols. I–III) show that the average achievements of Lithuanian students in reading, mathematics and sciences are still below the averages of students from other OECD countries. The lowest results were observed in the completion of assignments requiring higher-order thinking skills (e.g. in the area 'to evaluate and reflect on'), while the highest scores were obtained in 'to understand'. The percentage of students who did not achieve Level 2 (i.e. who experienced difficulties in information perception and reorganisation) is higher than the OECD

average. Therefore, the development of higher-order thinking skills (to analyse, compare, evaluate, conclude and search for information in new contexts) that enable a student to become a knowledgeable and resourceful expert learner is a relevant necessity in the national education system.

This has become a particularly relevant problem while intensively implementing inclusive education and striving for its high quality (Galkienė, 2017) because the full participation of all students in the process of education and the development of the qualities of a student expert learner, who constructs their own understanding, have not been sufficiently ensured. In Lithuania, more attention has been allocated to the teaching of students rather than student learning and the creation of means and environments that stimulate learning (Maniušis, 2018), and students generally lack the abilities of self-regulation and deep learning while creating their own knowledge (Degutytė-Kančauskienė, 2020). Schools and their teachers are in search of pedagogical strategies for creating conditions that enable all students (including those with SEN) to learn in mainstream education and become knowledgeable and resourceful learners. The UDL (see Chap. 1) is one of the new approaches of inclusive education and is open for its practical application and re-interpretation in its different socio-cultural contexts because the teachers who participate in the action research and follow the UDL guidelines (Novak, 2016) model specific goals, methods, means and environments to enable every student to be educated, develop optimally together with other students within their own powers and become an expert learner.

Striving to evaluate the influence of applying the UDL approach in the development of knowledgeable and resourceful learners in the inclusive school context, the following research questions were formulated:

– What qualities and abilities of the knowledgeable and resourceful expert learner are developed by applying the UDL approach?
– How do educational factors facilitate the development of knowledgeable and resourceful expert learners by applying the UDL approach?

7.2   Methodological Approach of the Research

The collaborative action process was chosen (see Chap. 3) to investigate the educational factors that contribute to developing the qualities of students as knowledgeable and resourceful expert learners by transforming the school practices of inclusive education following the UDL approach. The character of the planned local research and the active, self-reflected, self-transformative and investigative role of teachers fully coincided with the nature of action research (Mertler, 2019; Rowell et al., 2017; Ferrance, 2000). The teachers and the school principal, as well as the teachers and the authors of this study, actively discussed and reflected on the process of action research from the preparation stage to the end of the last cycle of action research. Charalampous and Papademetriou (2019) stated that teacher engagement

in collaborative dialogue promotes their deeper reflections. Collaborative action research is efficient while transforming the established routine practices, especially when there is a wish to test the influence of new strategies (the UDL approach in this case) of improving education quality (Rowell et al., 2017; Insuasty & Jaime Osorio, 2020).

Our collaborative action study consisted of three cycles (see Chap. 3): the first cycle aimed to identify the factors of inclusive education at school that are favourable or unfavourable for the development of knowledgeable and resourceful learners; the second cycle targeted the elimination of the student's learning barriers identified in the first cycle and the goal of the third cycle was to strengthen the successful practices modelled applying the UDL approach and eliminate the barriers of distance education. The action research was carried out by teachers from Vilnius Balsiai Basic School in cooperation with the researchers. The achievements in mathematics and reading of the school and of the sixth (seventh) formers who participated in the research were significantly higher than the average achievements of Lithuanian students. However, the level of completion of assignments that required higher-order cognitive skills, just like all over Lithuania, was significantly lower compared to those of other tasks (Report on Higher-order Thinking Skills 2019, the National School Student Assessment). Thus, the same problems related to the development of a knowledgeable and resourceful expert learner are characteristic of this school.

The school allocates considerable attention to the improvement of inclusive education because each class, including the one in the study, has several SEN students, as well as students from multilingual environments or who encounter learning difficulties due to other reasons. Teachers of English and Lithuanian who became familiar with the UDL approach and applied it for the first time participated in the research. After the second cycle of action research implementation, the quarantine due to the coronavirus was instituted, and all the schools switched to distance teaching. The teachers, who had already discovered the principles of education applying the UDL approach in the environment of contact education, were exposed to one more challenge—following the UDL framework while organising online lessons.

The following qualitative data collection methods were applied in the action research:

- Observation of lessons through audio recordings and writing comments: 38 lessons were observed (10 lessons during the first cycle and 14 lessons during the second cycle were observed in the classroom, while 14 lessons during the third cycle were observed online).
- Semi-structured interviews with students after the lesson (individually and in group): after every observed contact lesson, conversations were held with students whose learning was chosen to be observed to encourage them to reflect on their own learning; 43 interviews were audio-recorded.
- Student's reflections on the lesson: after the online lessons, the teachers asked their students to write down their reflections on their learning during the lesson; 37 written records of such reflections were gathered.

- Audio recordings of teachers' and researchers' reflections after the lesson: after every lesson, the researchers talked with the teachers about how they followed the UDL principles while organising their lesson, how they pursued the goal to develop knowledgeable and resourceful leaners and how they created a barrier-free learning environment; possibilities for improving their lessons were also discussed (38 audio recordings).
- Audio recordings of group discussions of teachers and researchers: the researchers and teachers discussed the changes in the teachers' attitudes and practices of inclusive education aiming at the development of knowledgeable and resourceful leaners, the challenges and ways of coping with them, discoveries, collaboration and learning (3 audio recordings).

The methods applied for the qualitative analysis of the collected data included content analysis according to Cohen et al. (2013) and thematic analysis following Braun and Clarke (2017).

7.3 Collaborative Action Research: Processes of Evolutionary and Breakthrough Change

The first cycle of action research (see Chap. 2) aimed to identify the contexts for the education of *knowledgeable and resourceful learners*. The teachers who conducted the action research identified the positive factors and barriers relevant to the improvement of inclusive education following the UDL approach in a Lithuanian school.

The *personal experience* possessed by the teachers differed (Fig. 7.1), and it was only partially favourable for improving inclusive education, aiming at the goal of the UDL approach to educate *a knowledgeable and resourceful learner*. Neither

Personal experience

Goda: 'I had had experience in inclusive education before. But it was not experience in applying the UDL approach.'

Alma: 'I learnt from zero'.

School context

Goda: 'A special pedagogue is a central figure'.

Alma: 'And then you send that child to the special pedagogue'. 'What UDL are you talking about? I have mathematical problems to solve'.

Teaching methods and aids

Goda: 'Attempts to model UDL in the Lithuanian language are based on the system of totally different national mentality'.

Goda: 'UDL in the English language is a transfer of tested methodology and aids to a different national context'.

☐ - a favourable context factor   ☐ - a barrier

Fig. 7.1 The context of developing a knowledgeable and resourceful expert learner in the Lithuanian school

teacher was familiar with the UDL approach but had accumulated different experiences in inclusive education.

> Teacher Alma: *I learnt from zero. I heard of the UDL as a system for the first time when I joined the action research.*
> The researcher: *What was your attitude towards inclusive education?*
> Teacher Alma: *This also had to be learnt. Over 20 years of experience, I have never had such a diverse group of so many different children with their specific needs. Therefore, it has been a period of discovery for me.* (The interview with teachers, 3)

> Teacher Goda: *I had had experience in inclusive education before. But it was not experience in applying the UDL approach. When Rita* [a special pedagogue] *worked in my school two years ago, our collaboration … was continuous.* (The interview with teachers, 3)

Lately, attempts have been made in Lithuanian schools to teach as many SEN students in mainstream classes as possible. However, teachers still lack practical experience in inclusive education. The *school context* (Fig. 7.1) is frequently unfavourable for the development of inclusive education practices. Special pedagogues, speech therapists and psychologists are encouraged to collaborate with teachers searching for methods and means to educate SEN students in mainstream classes together. However, these specialists traditionally tend to provide individual assistance to students in their offices, and teachers feel left alone. The teachers who joined the action research in a Lithuanian school, just like many teachers in the country, prioritised specialist help at the beginning of the action research, although they understood that individual support for student learning does not promote inclusive education for all:

> Teacher Goda: *We do not have any support from specialists. A special pedagogue is a central figure providing learning support to a student. … Because I … continued asking them to help me to construct scaffolds for that child.*
> Teacher Alma: *Well, when Tomas* [a special pedagogue] *worked in our school, all the paperwork was done at the beginning of the school year. All the* [SEN] *children were counted and described and plans for how to educate them were devised. But … that was all. And then you used to send that child* [from the lesson] *to the special pedagogue.*
> Teacher Goda: *The speech therapist* [resided] *in her wing, somewhere separately. But no specific assistance, never.* (The interview with teachers, 2)

The teachers acknowledged that when only two teachers engaged in the improvement of inclusive education by applying the UDL approach, they lacked support from their colleagues. Some teachers continued working following the subject-centred paradigm of knowledge transfer: the learning itself and the taught subject, rather than the student, are the centre of attention.

> Teacher Alma: *We talked to teachers of mathematics, and they said: 'What UDL are you talking about? I have to solve mathematical problems'. That's it. There is a mathematical problem.* (The interview with teachers, 3)

The ideas of social and educational exclusion that are still obvious in the society in the country also become a barrier to inclusive education at school because segregational attitudes penetrate into the school environment through parents:

Teacher Alma: *You adapt the programme to the child in that total mass of students; you assign a tolerant friend or a just child, whose father will not contradict that a weaker* [learner] *is sitting next to his son or daughter.* (The interview with teachers, 1)

The teachers' experience shows that improving inclusive education implementation may be more successful if the whole community is engaged in this process.

The teachers conducting the action research emphasised the barriers related to *teaching methods and aids* (Fig. 7.1). Since English is taught using adapted textbooks and other aids by foreign authors, the methods used in the material are based on a different mentality, which is closer to the UDL approach and more favourable for inclusive education. However, Lithuanian language textbooks serve as barriers to inclusive education. The teachers themselves have to eliminate them by following the UDL approach and developing new methods and aids. All this requires intensive consideration, hard effort and a large time investment.

Teacher Goda: *During the Lithuanian language lessons, we perform some experiments on how to model learning on the basis of a totally different national mentality system. ... It has to be transferred to another medium, which is cardinally different, that is, anti-UDL. ... For example, I have a Lithuanian textbook published 30 years ago and I have a new textbook for the Lithuanian language. Transfer of knowledge prevails there. ... This is theory, a lot of it* [theory] *(shows the pages in the textbook). ... And then exercises start. They are all have the same structure. ... And we remain in this medium of knowledge transfer very successfully. ... For English, we have a transfer of already tested methodologies and aids to a different national context.* (The interview with teachers, No.3)

In the second cycle of action research, the teachers applied the UDL principle 'Provide multiple means of representation' to improve the quality of inclusive education, targeting the education of a *knowledgeable and resourceful learner*. *Going deeper into UDL* (Fig. 7.2) posed a challenge to the teachers. Teacher Alma went through a transformational breakthrough in her attitudes when she looked at students with different needs, her own teaching perspective and her acting and thinking habits through the prism of UDL. The reconstruction of teachers' self-evident and settled practices through critical reflection is usually followed by tension.

Teacher Alma: *But all the CAST texts were hardly understandable to me—a lot of everything and at different levels. You have to know a lot. ... I thought, oh well, you had to start this action research just to realise that you know nothing. ... When you evaluate yourself, you evaluate according to what you do not do. I understood that I had to start learning again. So my self-esteem as a teacher or as a specialist was very low at that time.* (The interview with teachers, 3)

Teacher Alma overcame the critical point by *practically testing* UDL ideas, discovering new possibilities for the development of students as *knowledgeable and resourceful learners* and constantly reflecting on them:

Teacher Alma: *But later that learning occurred naturally. If you don't know something, you go on YouTube and watch videos. Then you start applying this in your lessons and discover how to do this or that. ... This action research opened up new opportunities to understand the process of education in a different way for me. This process offers numerous choices for a student on how to learn or how to show what he or she has learnt. I tried out how to present information in several ways and to create choices for learning.* (The interview with teachers, 3)
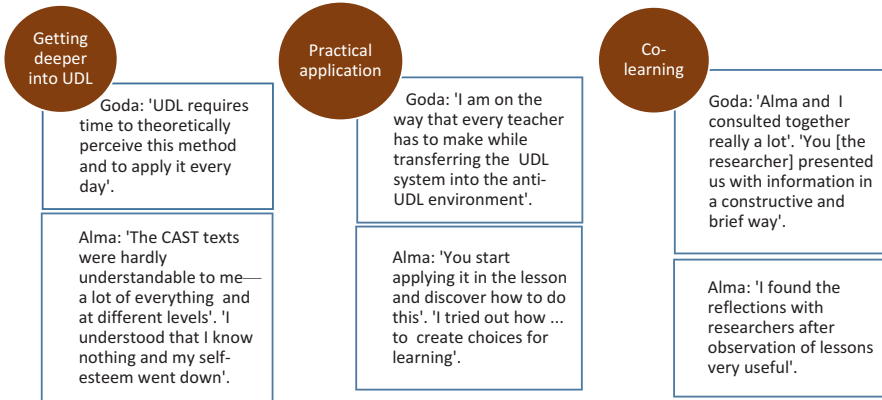
Fig. 7.2 The search for ways to develop a knowledgeable and resourceful expert learner gradually by mastering the principles of UDL

Teacher Goda experienced a slow, evolutionary process of change in her practices, grounded on the theoretical construct of UDL and aimed at developing a knowledgeable and resourceful learner. *Going deeper into UDL* was time-consuming, which is typical of deep learning.

> Teacher Goda: *I experienced evolution rather than a breakthrough. … UDL requires time to theoretically perceive this method and to apply it every day. I just need slightly more time. If that were my working language, it would be easier. … Because it is a system. To apply a system is different from applying its separate elements*. (The interview with teachers, 3)

The previously acquired experience in inclusive education was very helpful to the teacher. Evaluating the improvement of inclusive education in light of the goal of UDL to educate and develop a knowledgeable and resourceful learner, the teacher emphasised a constant, slow and deep movement forward, changing the essence of the educational process:

> Teacher Goda: *I am on the way that every teacher has to make while transferring the UDL system into the anti-UDL environment. I have applied most of the principles all the time, and I really want to change our system of education as much as I can.* (The interview with teachers, 3)

The teacher stressed the benefits of *co-learning* (Fig. 7.2), constant consultations with each other at school and after lessons, planning lessons and reflecting on the analysed sources or viewed recorded lessons. The teachers also considered discussions with the researchers to be very useful because they helped to attain a concentrated understanding of the essential UDL principles and to identify the features of students' active perception, deep understanding and thinking in learning activities. They also found the reflection sessions after the observed lessons very helpful.

In the third cycle of action research, a challenge to transferring the discovered ways of inclusive education following the UDL principle 'Provide multiple means

of representation' emerged in the context of distance education (due to the COVID-19 pandemic). The goal of developing a knowledgeable and resourceful learner had to be achieved under changed conditions.

While conducting the action research, the teachers envisaged their *personal strengths* (Fig. 7.3), which helped them to cope with new challenges and transfer the acquired experience into the system of distance education. For example, Teacher Alma's strength was openness to change, which allowed her to modify her attitude towards the process of teaching. The teacher's position towards the development of the student *as an expert learner* and towards the relationship between the powers and responsibilities of the teacher and the student underwent changes. The teacher understood that, through UDL, the student's perception becomes more active, the student constructs a deeper personal understanding and appears to be an expert in their own learning, being able to choose how to learn.

> Teacher Alma: *It seems to me that I am ... very open to change. This openness helped me to change. ... I understood that it is important to allow children to choose how to learn themselves. But I had to discover myself how to achieve this in the context of* [face-to-face and distance] *education. ... I became more oriented towards the student and their improvement, putting more responsibility for their learning on their shoulders.* (The interview with teachers, 3)

The teacher's openness to innovation and the necessity of moving into the environment of distance education encouraged her to look for digital learning technologies that could provide students with more choices regarding learning modalities or tools. The teacher discovered virtual environments which increased *inclusion for all students*, promoted self-directed learning, ensured learning success by allowing a student to choose the most appropriate learning methods and aided him or her.

> Teacher Alma: *I discovered the power of video records and digital tools for learning English online. ... Video records have subtitles. You can stop and read them, you can switch on the dictionary, type in the word, and immediately see the translation or hear its pronun-*

Personal strength

Goda: 'I had always encouraged my students to learn independently but I used to do that in a more elementary way. And here I went through evolution'.

Alma: 'I am very open to change'. 'I have a different understanding of the process of inclusive education—as a creation of choices how to learn'.

Student expert learner

Goda: 'I started observing every student more attentively—how they search for information, what and why they choose and what suits them best'.

Alma: 'Now I put more responsibility for their learning on students' shoulders'.

Inclusion for all

Goda: 'Inclusion in my classroom turned into deeper one. I apply the majority of UDL principles that educate every student as a learning expert as the basis of inclusion'.

Alma: 'I discovered the power of video records and digital tools for learning English online'.

Fig. 7.3 A maturating attitude towards the development of a knowledgeable and resourceful expert learner by applying the UDL principles

ciation. ... You can switch on all the tools for checking spelling while writing. (The interview with teachers, 3)

The *personal strength* (Fig. 7.3) of teacher Goda, who underwent an evolutionary change in her attitudes, was the promotion of her students' self-directed learning. Applying the UDL approach encouraged the teacher to place less accent on the special pedagogue's (who worked in a separate office) individual support of students and to create an environment that includes every student in the process of co-learning by providing the possibility to search and make one's own choices on how to learn.

Teacher Goda: *I had always encouraged my students to learn independently, but I used to do that in a more elementary way. And here I went through evolution. I started observing every student more attentively—how they search for information, what and why they choose and what suits them best. I look at the students who experience difficulties with even more attention now. I provide them with more help now. ... Inclusion in my classroom turned into deeper one. Better considerations and planning of higher level. ... I apply the majority of UDL principles that educate every student as a learning expert as the basis of inclusion.* (The interview with teachers, 3)

Generalising, it can be stated that the action research study targeted at developing a *knowledgeable and resourceful expert learner* with the help of UDL principles encouraged teachers to look more attentively at the differences between and possibilities of students with different needs and helped them to search for multiple means of information representation. The evolutionary or breakthrough paths for changes in the teachers' attitudes and practices were predetermined by conditions such as teachers' personal experience and school context.

7.4   Educational Practices of Students' Becoming Knowledgeable and Resourceful Expert Learners

Actively Perceiving Learners: Stimulating Students' Active Information Perception Processes An actively perceiving learner not only watches but also sees, not only listens but also hears. The emotional management of perception processes and the active selection of information following one's own experience and interests are also characteristic of such learners. While teaching students with different needs, teachers searched for ways to stimulate the information perception processes of each student to make their learning more efficient. While conducting the action research study, the teachers organised lessons following the UDL approach and discovered directions for educating students to actively perceive information and for increasing the inclusion of every student. These directions are provided below.

Gamification that Activates Information Perception Employing Information of Several Modalities The research data show that information provided in multiple

ways and its gamification stimulate the perception of typically passive students. The lesson fragment provided below proves that Tadas' perception was activated by employing a combination of ways of presenting information (as video and audio material), through the gamification of learning (organising a quiz) and by providing additional motivation (a plus for a correct answer). One of the goals of the lesson was to remember ancient works and tools to prove that the Lithuanian folk song '*Rūta žalioji*' (Ruth the Green) is a work song. The teacher showed some pictures on the screen, and the children were asked to guess the tools they saw and their purpose.

> Teacher Goda: *I invite you to take part in a quiz. You'll have to guess what working tools you see. You'll have to name them, too. … The three best students get pluses. … Raise your hand if you see a tool you know.*
> Having shown an old scratch plough, the students gave the correct answer almost unanimously: *A scratch plough.*
> Tadas: *A board.* (A spindle was shown.)
> Teacher Goda: *Ok, it is a board, but what is it used for?* (Nobody guessed this tool right. The teacher gave its name and explained its purpose.)
> Tadas: *A scythe.* (A sickle was shown.)
> Teacher Goda: *No.*
> Tadas: *Wait a minute, this is... a sickle!* (The other students had given the correct name of the tool earlier. Tadas did not get points, but he actively engaged in guessing and was more active, although he did not raise his hand.) (Observation, 12)

This fragment of the lesson reveals the student's involvement and active search for a concept: Tadas provided the name of a similar concept (a scythe), searched for the right word ('*Wait a minute, this is…*') and then found the word 'sickle'; he also named the material the tool was made from (board). The pictures of working tools activated the students' perception of the tools' functions and enabled them to remember the name of a tool the students had heard of before. Moreover, the perception of Tadas was also activated by the quiz. Even without raising his hand, the student was eager to say the names as early as possible. According to the teacher, '*His strongest side is competitive learning*' (Reflection with the teacher, 12). The teacher had also noticed that playful competition helped each student to learn better. During the contact lessons, the teachers included the channels of as various modalities for the perception of information (e.g. to demonstrate active and passive participles: '*frying eggs*' and '*fried eggs*' with the help of body). Exposure to different teaching modalities increases the chance of one of them activating the information perception processes of students stronger than others. Moreover, one way of conveying information may be more favourable to one student than to another. Thus, receiving information through different modality channels and gamification can change students' perceptions from passive to active.

Insight into the Meanings of General Concepts and Expressions Through the Relevant Context of Personal Experience Information perception processes are activated when the learning material is linked to a personal experience that is relevant to the learner. This increases the inclusion of every student in the learning process and ensures learning success. To ensure a more active expansion of stu-

dents' English (non-native) vocabulary and to enable them to better understand the meanings of phrasal verbs, Teacher Alma chose a topic relevant to the students (self-isolation) and encouraged them to use active phrases to present their own experiences. The children were asked to read the text 'Stir-crazy and climbing the walls (Life during lockdown)' by Kate Woodford, to memorise the relevant phrases, to apply some to themselves and to describe their own self-isolation experience during quarantine.

> Vaida reads the sentence: *There is a coronavirus in the world; everyone needs to be seated in a lockdown.*
> Teacher Alma: *Elzė will express her opinion if this is a minus or a plus.*
> Elzė: *This is a minus. This is bad for people who do not like being at home. And they lose jobs.*
> Teacher Alma: *Yes, that's right. Maikas, give your sentences, please.*
> Maikas: *Shall I show the sentences?*
> Teacher Alma: *Yes, please... It is easier for other students to discuss when they see and hear them.*
> Maikas reads: *In this quarantine, I'm getting to grips with my school lessons.*
> Teacher Alma: *Yes, you have used the phrase 'getting to grips'. What does it mean?*
> Maikas: *Trying to learn.*
> Teacher Alma: *Ok. Vaida, is it positive or negative?*
> Vaida: *I think, it's positive.* (Observation, 35)

Learning new expressions based on relevant personal experience helped the children to better understand the meaning of these expressions. After quarantine was instituted in the country, self-isolation became an experience relevant to everybody. The students found it interesting to talk about their own experiences and express their opinions about the positive and negative aspects of this state. For this reason, they attempted to clarify the meanings of many previously unheard expressions, memorise them and use them correctly in sentences. According to the teacher, all the students, even the weaker ones (e.g. Maikas' English language skills are lower compared to others because he comes from a multilinguistic environment), memorised and properly used expressions (phrasal verbs) in their sentences. Distance learning turned out to be very convenient to access digital texts, complete assignments, demonstrate them to others and comment on them. During the online lesson, the teacher allocated a considerable amount of time to independent communication on the topic, for which the students prepared in advance and which enabled the learners to successfully develop oral communication skills as well.

The perception of information that is unrelated to personal experience is usually a challenge for students, as well as the teacher, and the latter has to consider it a possible barrier to information perception and to search for educational solutions in advance. And what if the lesson has to be delivered online due to the coronavirus pandemic? Applying the UDL approach, the teacher of Lithuanian found appropriate solutions for organising the lesson—for example, emphasising the emotional aspect of information that is distant from personal experience through the live experience of another person in the context of online learning and through the presentation of information employing different modalities and means.

The observation of online lessons revealed that students *emotionally sense information that is distant from their experiences and better understand it through the live experience of another person.* As expert learners, they recognise and identify information that evokes their emotions; this information can also be better memorised and may change their behaviour. This is illustrated by the following example from a lesson. The teacher of Lithuanian foresaw the barriers for seventh formers to understanding the creative meanings of the Lithuanians exiled to Siberia and other remote areas by the Soviet government (1940–1950) because they did not possess such experience. According to the teacher, the meanings of exiles' creative works would become closer to the students if a living witness or a young person who came into contact with the remaining witnesses of the exile (with former exiles still living in the areas of deportations or taking part in finding and cleaning the graves of Lithuanians there, etc.) would tell the students about exiles and their fates. The teacher invited a member of the expedition 'Mission Siberia' to the places of deportation to take part in an online lesson. The students' reflections at the end of the lesson show that it was as if the statistical data on the deported people became alive: Pijus said, *'I haven't known that so many people were exiled. I thought the numbers were slightly lower.'* while Morta remarked, *'The huge number of deported people made an impression on me'* (Reflection with students, 29). The aspect of emotional experiences was felt in the children's comments and evoked by the stories of the participant in the expedition 'Mission Siberia'. Comparing the number of deported people to the population size of Kaunas and the territory occupied by the camps to that of France turned pure statistical figures into live images in the children's minds and contributed to a better understanding of the scale of the national tragedy and suffering. The students' reflections also showed that emotionless numbers on exiles became live people with names, surnames and their own fates. Kotryna reflected on her understanding and expressed this thought as follows: *'I understood that these people are not statistical figures. They have families, so perhaps I'll join the reading of their names and fates'* (Reflection with students, 29). The children's reflective considerations were prompted by the participant in 'Mission Siberia', who told about the annual commemorative campaign 'Say it, hear it, preserve it' held in the town squares, where the exiles' names, surnames and fates (returned, did not return or unknown) are read from morning to evening. Kotryna's intention to join the readings of names and fates proves that strongly emotionally charged and perceived information is capable of changing values and behaviours. The lesson also showed that distance learning does not weaken the transfer of another person's living experience. On the contrary, using images, sound and video allows for conveying enriching information and enhances the impression left on the audience.

Another online lesson disclosed that the *presentation of information through different modalities and means* is useful for the acquisition of absolutely new experiences and the generation of new ideas. During the distance lesson, which aimed to enable the students to better understand the meanings, attitudes and experiences in the creative works about the partisan war striving for liberation during the Soviet Union occupation (1944–1953), the teacher used a video and pictures of the partisans' life, schematics in PowerPoint and a narration. Then, all the students read

aloud an extract from '*Apie laisvės kovą ir didvyriškumą*' ['On freedom fight and heroism'], a complex work written by partisan movement participant–writer Bronius Krivickas. The further discussion clearly showed how the students linked the information on partisan fights received in different ways with the ideas expressed in the writer's work. The students provided various opinions, as follows:

Sofija: *He admires partisans.* (about the writer's feelings and attitude)

Pijus: *I think he wrote to encourage partisans to fight stronger.* (about the writer's joining the partisan movement)

Tadas: *Maybe because he is approaching death.* (The student thinks about the writer's legacy after his death because the writer felt he could die soon.)

Vaida: *I think that he wanted to show other generations how people fought for freedom.* (about the enduring value of creative works)

Antanas: *I admire their* [partisans'] *persistency. They knew that enemies were stronger but, nevertheless, they continued fighting for their freedom.* (about the inspiration that the described fights of the partisans provide) (Observation, 31)

The fragments of lesson demonstrate that the teacher successfully predicted the possible barriers in perceiving the meanings of the creative works of partisan writers because partisan fights constitute a very distant, entirely new and hardly understandable experience for seventh formers. To help her students to learn about and understand the phenomenon, she employed alternative ways of presenting the information. Understanding the experience of partisan writers later contributed to successful insights into the ideas behind the writer's work, their considerations and verbal expression. The students' reflections revealed that they identified what had helped them to better comprehend the theme. Since the information was presented in different ways, the students were able to comprehend it in a personally suitable way, and they succeeded perfectly in envisaging such a way.

Vaida: *I read attentively and followed the lesson, watched an extract of the film, wrote down essential things from the teacher's slides. This helped me because I was able to better memorise and understand what I had learnt.*

Sofija: *I used the textbook because the material is presented there in the most appropriate and easiest way to me.*

Teofilius: *The textbook. Because it is easier for me to read than to listen to.*

Maikas: *I used the internet website* www.partizanai.org *for this assignment. This helped me to find out more information about Lithuanian partisans.*

Kotryna: *I used my exercise book and pen … and listened very attentively because I memorise what I write down better.* (Reflection with students, 31).

Vaida relied on several modalities of learning: video, written text, verbal information, schematics and own notes. Other students prioritised other modalities: Sofija—the textbook (reading) because the information there is adjusted to the learner's age and is accurate; Teofilius—text reading (because it is difficult for him to concentrate while listening); Maikas—Internet information because it is visual and attractive; and Kotryna—kinaesthetic aspect (writing down information). Thus, applying the UDL approach, the students successfully used the provided possibility of receiving information in alternative ways and successfully reflected on this experience. Distance learning creates favourable conditions for students to acquire new experiences through channels of different modalities that are acceptable to them.

Self-directed Learners: Transformation of Teacher-Guided Student Learning into Self-directed Knowledge Creation The application of the UDL approach helped the teachers to gradually decrease their direct leadership and encourage students' self-directed learning. Several aspects of lesson organising that increase possibilities for students' self-directed learning and facilitate students' reflection were identified during the action research. In the context of contact learning, situations of self-directed learning were created using multimodal presentations of information and pair or group activities that promoted learning from each other. During the period of distance learning, group activities for learning something new were not used almost at all due to technical limitations and the quarantine restricting social interactions. However, employing multimodal presentations of information and gamification facilitated the creation of self-directed learning situations and students' self-directed checking and correction of their completed work. The creation of an inclusive education environment applying the UDL principles improved the development of every students' self-directed learning skills, ensuring greater success in learning.

Self-directed Discovery of Word Meanings in the Context of Multimodal Presentation of Information and Team Learning The self-directed learning of students is encouraged by situations in which the learning material is presented and the learning process is organised in different ways, creating conditions for the students to independently clarify and understand new information. The creation of such a learning situation is illustrated in one of the observed English lessons (Observation, 14). The goal of the lesson was 'to learn new words/phrases related to food'. In order for students to clarify the meanings of unknown English words and phrases themselves, they were asked to watch Jamie Oliver's video '15-Minute Meals'. While watching the video, one group of students was asked to write down the words of ingredients and the other group was assigned the task to select the verbs related to actions of food preparation. Later, both groups created sentences together: one group gave an action of food preparation, the other—an ingredient. The three observed girls successfully used the video material to develop their vocabulary on food preparation. In their reflections, they pointed out that the video material helped them to independently 'discover' the meanings of words and phrases. The girls understood and clarified the simultaneity of information received in different modalities—the video helped them hear the word and see the object or action performed by the doer. The simultaneity of receiving information by hearing and sight 'unlocks' the word meaning and helps the students to learn words on their own. For example, Vaida commented, '*The video was most useful. … They say what they do, you hear and see and understand the word this way*'. Teamwork, when one team gave a verb and the other provided a related ingredient, helped the girls to make collocations. Justė said, '*This allowed connecting a particular food word with a cooking action*'. When asked about challenges or obstacles, the girls identified the problem of writing down the heard and understood words: Sofija stated, '*To write the words down was most difficult. … We understood all the words, but it was difficult to write them down without mistakes*' (Reflection with students, 14). The expe-

riences of the girls as expert learners show that properly chosen video material promotes the self-directed enrichment of vocabulary. However, no thoughts were given about any scaffolds in the lessons that helped the students learn the spellings of the new words. Teamwork partially contributed to overcoming this challenge: Sofija said, 'For example, [my team member] *helped me with the spelling of the word I did not know how to write it'* (Reflection with students, 14). Thus, appropriately used modalities of receiving new information, especially if more than one is applied in the lesson, as well as teamwork that is favourable for learning from each other, promote students' self-directed learning and becoming expert learners. By modelling situations of self-directed learning, the teacher has to foresee what obstacles may be encountered by the students and to create scaffolds useful for coping with barriers.

Creation of Self-directed Knowledge Using Multimodal Means of Receiving Information and Gamification in the Context of Distance Learning   Under the conditions of the coronavirus pandemic, the English teacher Alma improved the modelling of situations for the self-directed construction of one's own knowledge in distance learning environments. Pursuing the lesson goal of learning to speak about famous people in English using the past simple tense, the teacher created a complex situation of receiving information through channels of different modalities: she prepared questions that required answers using the past simple (for understanding the relevant language structures and their use) and suggested that students find answers to the questions (vocabulary, phrases) while watching the video 'Christopher Columbus 1451–1506. Educational Video for Kids'. The students could also look at the images and listen to the speech, stop the video and read the subtitles, write down the necessary words or go back and listen to the phrases several times. Thus, the environment was created for the students and enabled them to receive information via different modalities, manage the object of receiving information (a video) and learn at their own pace and in their own style. A student can perceive information in a complex way (through video and audio simultaneously) if this facilitates their learning or can focus more on images and subtitles, depending on the student's strengths in comprehension skills. After the students completed the assignment, the teacher asked Timotiejus:

> Teacher Alma: *Where did he plan to sail?* [in Lithuanian] *To South America or somewhere else?*
> Timotiejus: *To America.* [the SEN student did not understand where Christopher Columbus had initially wanted to sail and named the destination he had reached instead.]
> Teacher Alma: *What do others think? What did you understand?*
> Sofija: *He planned to sail to India.* ….
> Teacher Alma: *Why did they do that?* [in Lithuanian] *Why did they invest?*
> Vaida: *They wanted new things.*
> Teacher Alma: *Kotryna, how many ships travelled?*
> Kotryna (in Lith.): *I haven't written this down.*
> Teacher Alma: *But you have seen the video.*
> Kotryna: *Three ships sailed.* (Observation, 32)

The lesson fragment showed that the information received in multiple ways and the modelled situation of its search encouraged students' self-directed learning. The majority of students provided correct responses to the questions. Sofija and Vaida understood the information accurately and used the past simple tense. Kotryna had not marked the answer while watching but was able to provide the correct answer referring to the visual information. Timotiejus, who had language comprehension problems, failed to understand both the teacher's question and the video properly. If the teacher had presented the question in writing and pronounced it, it would have been easier for him to understand. Scaffolds would have been helpful as well: to plan to sail—to sail. The student himself knows very well that images and keywords help him a lot. Distance learning did not impede but only helped to obtain information in different ways. While reflecting on the lesson, the teacher explained that she used multimodal information acquisition channels in a targeted way and that they proved to be efficient while developing the skills of students in perceiving information. In the words of Teacher Alma, '*Perception of information occurs through a big number of channels. Earlier I thought that it was enough to find a text, to print it out and bring it to the classroom ... Now I understand that they need a lot of visual information, significant visual enhancement on the same theme. Now I try to show them a video on the related theme ... [f]or vocabulary development or consolidation of grammar*' (Reflection with teacher, 32). It is clearly seen that by providing new ways of presenting information, the teacher focuses on the whole class to enable every student to choose a personally appropriate modality. This facilitated the students' self-directed learning.

Delivering another lesson, which aimed 'To revise the formation of the past perfect tense', the teacher applied a multimodal method of information presentation—gamification—a thinking tool for the selection and systemisation of knowledge. The teacher suggested watching the playful video 'The Grammar Gameshow. The Past Perfect. Episode 13', which targets adolescents and presents the information in the form of a 'Mindfight'. She recommended to the students to clarify and select the essential information on the past perfect by focusing on three essential meaningful units and filling in a three-column table with the following headers: 'How is it formed?', 'When to use it?' and 'Time expressions'. The lesson fragment showed that the students successfully coped with the assignment:

Teacher Alma: *Who would like to explain how this tense is formed?*
Gritė: *Had + 3rd form of the verb.*
Teacher Alma: *Ok.* [She writes the information in the table, which is shown on the screen for the students.] *How to use it? Who would like to read?*
Sofija: *What had happened by a certain time.*
Teacher Alma: *Let's specify what had happened in the past before another action in the past.* [She writes in the table.] *Ok. Can you give an example?*
Sofija: *We had talked before the dinner started.*
Teacher Alma: *Now time expressions, please.*
Vaida: *I don't know if it's ok or not, but I've written 'by the time'.*
Teacher Alma: *Ok. 'When' is also correct.* [She writes in the table]. (Observation, 33)

The lesson fragment clearly proves that the change in the teacher's position (from conveyer of information to students' learning coordinator), an active search for and selection of information, its division into smaller meaningful units and, at the same time, seeing a general picture is encouraged. The students understood and selected information on the past perfect while watching an interactive game with episodes that contained body language, spoken language and subtitles, all of which improved their understanding with the help of emotionally coloured, playful information presented in various modalities. The three-column table provided by the teacher was a very useful thinking tool which helped the students not to forget to follow the key references, ensured a selective watching of the video and encouraged them to think over the received information. Filling in the table together with the students, the teacher enabled them to memorise certain meaningful units and use them later. While reflecting on the most appropriate ways of learning, the students emphasised watching the video: Maikas said, '[I would like] *the teacher to send me the video with explanation*', while Elzė affirmed, '*I like watching video because it is the easiest way to get information for me*' (Reflection with students, 33). Thus, obtaining information themselves from internet learning objects is appropriate for the students and facilitates their understanding.

Self-directed Checking and Correction of Completed Work Using Tools of Distance Learning Platforms The self-directed distance learning of students was significantly enhanced by the platform Google Classroom used by the teacher. Reflecting on the possibilities of distance learning, the teacher explained, '*I discovered this Google Classroom. Everything is convenient here—corrections of children's works and comments, which are visible to them. And they can correct and send back*' (Reflection with teachers, 2). The students' reflections showed that the Liveworksheets exercises were helpful to them, especially when the online exercises were assigned to them according to their level. After completion, a student can look through the exercise. As mistakes are shown automatically, a student can redo the task until the result satisfies them and then send it to the teacher for evaluation. This is how their self-directed learning occurs, and as expert learners, they are able to reflect on it. Gritė indicated, '*While learning, I really like to do assignments on Liveworksheets because you complete them and know your mistakes*' (Reflection with students, 38).

Constructing Deep Personal Comprehension: Grasping Patterns and Using Knowledge Organisers and Scaffolding Students' deep understanding is constructed by restructuring the received information and linking it with their previous knowledge, changing the ways and perspectives of information reflection, envisaging new ideas and meanings and understanding the separate parts and the whole. Knowledge organisers and scaffolding applied in the context of inclusive education help every learner to construct deeper personal knowledge.

Grasping Models for the Reorganisation of Information and Possessed Experience, their Clarification and Use in the Thinking-Promoting Environment of Team Learning Seventh formers have extensive live experience, but it has not been systemised into science-based concepts, structures and systems. The ability of students as expert learners to employ models for the reconstruction of this experience tends to deepen their knowledge and understanding. Striving to develop the qualities of expert learners in their students, teachers successfully used structural models for the reorganisation of information. The observation of the lesson, where the students prepared for the analysis of work songs, revealed the process of how the properly chosen tool of visual thinking, group work and the possibility to use a variety of information sources enabled students to systemise their possessed unstructured knowledge into a system with clear logic. The teacher asked students to group old works performed in the past according to the seasons of the year: '*Draw a circle of past works. Divide it into four parts—four seasons of the year. There should be at least two activities in each part. Use the internet, your friends' help, textbooks*'. Contemporary city children encounter a serious challenge in attributing the works performed almost a century ago to seasons of year. They are not very well aware of agricultural works (which are not typical of townspeople) and do not know the seasons in which they were carried out in. Vaidotas, Tadas and Antanas were members of the same group.

> Vaidotas: *What did they do in spring?*
> Tadas: *They ploughed*.
> Vaidotas takes initiative in the discussion: *And what about winter? In winter? They chopped wood*. (The student is right—people used to take care of wood in winter after the agricultural work was over.)
> Antanas: *Do they chop wood in winter?*
> Tadas: *So when do they chop wood?*
> Vaidotas: *They chop* ... (The student searches for information on the internet.)
> Antanas: *They chop wood in autumn*.
> Tadas: *So, do they chop wood in autumn? Or in winter?*
> Vaidotas: *They ploughed the land in winter*. (The student is wrong.)
> Tadas: *It is impossible to plough in winter. Land is frozen*.
> Vaidotas: *Ok, winter. What do they do in winter?*
> Tadas: *People chop wood*.
> Vaidotas: *Let's write it down. They chop wood*.
> Vaidotas: *They fish in winter. On the ice*.
> Vaidotas asks the teacher: *Can people fish in winter*?
> Teacher Goda: *Yes*.
> Vaidotas: *When do they plough?*
> Teacher Goda: *They plough two times. In spring and in autumn*.
> Vaidotas: *I didn't know that*. (Observation, 17)

In this case, the students reorganised their inaccurate experiential knowledge into a logical system using the visual thinking tool 'The circle of works in the past', discussing with each other, providing arguments to support their idea, referring to the internet and checking with their teacher. The students successfully completed the assignment. Initially, inaccurate knowledge was turned into solid systemic

knowledge through the common process of knowledge construction, which is beneficial to every child.

The Use of a Knowledge Organiser and Scaffolding for the Construction of One's Own Knowledge and Reflection The UDL context created in a targeted way encourages children to think of and strategically use methods of abstracting features of compared objects from provided practical examples. This is illustrated by the situation described further. The students were learning to write a formal and an informal letter. The teacher introduced a challenge to the children: '*Today, we are going to analyse examples* [letters] *as scientists and to fill in a table ... We are going to clarify the differences between a formal and an informal letter*'. The children worked in groups. In the beginning, Kotryna, Vaida and Justė had a chaotic discussion, but Vaida found a strategic way of working on the assignment and explained it to the other girls: '*In the beginning, I read what is written in the letter. And then I chose words to describe it. Or I write an example*' (Observation, 11). Vaida understood how one could consistently compare the letters and abstract their features: by reading the beginnings of the letters, thinking about how an informal and a formal letter start, reading the content and finding the words to characterise the language of the text, reading the endings and reflecting on the differences. Reflecting on his own learning, Vaida positively evaluated the benefit of the *knowledge organiser*—the comparative table 'Informal letter–formal letter'. According to the Vaida, the two adjacent columns helped to more clearly distinguish the differences and abstract the features: '*That table. We wrote one thing* [in one column]*, we wrote the other thing* [in the other column] *and then you see everything*' (Reflection with students, 11). The presented example shows that a learning situation which directs students to independent work through scaffolds (in this case, a useful table promoting children's thinking) facilitates children's independent development of new thinking strategies and deepens their understanding.

Reflection on Possessed and Newly Acquired Knowledge by Applying Thinking Tools in the Context of Distance Learning To facilitate the development of the skills of expert learners—learning to recognise what they already know and the new information they are learning—and to improve their English communication skills, the teacher asked the students to watch the video '300 English Questions and Answers', which provides questions and answers as text and verbal information. The teacher suggested watching the video for three minutes and then drawing a table with two columns titled 'I knew' and 'I didn't know'. She also asked the students to write three questions and answers in one column and another three questions and answers in the other. The students were asked to present the results during the lesson: 'To which questions did you already know the answers? Which answers contained totally new information for you?'

> Teacher Alma: *Let's start with what you knew.*
> Augustina: *What is the capital city of Spain?*
> Teacher Alma: *Say in a full sentence, please.*
> Augustina: *I know that the capital city of Spain is Madrid.*

Teacher Alma: *Use the form—I already knew that ...*
Augustina: *I already knew that the capital city of Spain is Madrid.*
Teacher Alma: *And what was new to you*?
Tadas: *I didn't know that an ant can lift 50 times its own weight.*
Teacher Alma: *Why did you know some things, but you didn't know others?*
Tadas: *We knew general knowledge but didn't know specific facts.* (Observation, 36)

The lesson fragment shows that it was a very suitable exercise to encourage the students' considerations about what they did and did not know. The video was convenient for the students themselves to make this distinction, answer the questions choosing the appropriate sentence beginning and write each answer in the appropriate column. The recognition of new information and linking it to already possessed information contribute to constructing deep personal understanding.

Balancing Students' Authentic Knowledge Creation and Co-Creation of Knowledge Following the UDL approach, a shared learning context for all the students in the class was created, although particularly considerable attention was allocated to the creation of learning alternatives and the possibility of learning in different ways and using different means. Being able to learn alone, in pairs, in groups or all together contributes to balancing the individual and to the collective creation of knowledge. The action research revealed the methods discovered by the teachers to organise lessons by ensuring the individual and collective creation of knowledge in parallel. All the students were included in the co-creation of knowledge through the use of various prerequisites to support each other's learning.

The Use of Created Possibilities for Learning in One's Own Style in the General Context of Contact Learning The observation of lessons revealed that the children's group work, a visual thinking tool (a comparative table titled 'Informal letter-formal letter') and an extra help tool (examples of how to fill in the comparative table) used as scaffolds to promote children's thinking established favourable conditions for students to learn in their own learning style. The situation presented further shows how Justė used her learning style in the UDL context. She is most successful at being a proactive learner, communicating, raising questions and using scaffolds for the whole class (systemising information, additional information, etc.). She read the text of the letters and the names of the two parts of the comparative table aloud, asked her group friends questions (e.g. '*Is this formal or informal* (showing the text)?') and checked with them whether she was thinking in the right direction. When her group members did not answer her question of how to formulate a complaint in a formal letter in English, the student raised her hand and asked the teacher, who answered, '*Make a complaint*'. Thus, the student's vocabulary was expanded by introducing new concepts. The student actively used an extra help tool. Using help from her group friends, Justė corrected the farewell phrases of the informal letter from 'please' to 'love you' and 'bye'. She finished the formal letter using the teacher's explanation, only in her own form: '(*Dear Sir/Madam) Yours faithfully; (Dear Mr./Mrs.) Yours sincerely*' (Observation, 11). Reflecting on her own learning, Justė emphasised that the independent search for information is an acceptable way

of learning for her '*because you can discuss with your group members. Reading can help you to memorise better, and your group members can help you too. ... [When you work on your own,]* you see what you don't know. And you can also ask the teacher. And when the teacher tells you everything, then you think—ok, I'll remember this, I'll know that. I won't need to learn this. And then you don't learn everything you have to*' (Reflection with students, 11). The discussed fragment shows that the created learning situation was favourable for her to learn in her own style—through collaborative learning.

Supportive Construction of Knowledge in the General Context of Distance Learning The students' ability to use mutual support to construct a common understanding is one of the most relevant abilities of expert learners. During contact learning, the teachers frequently used pair or group work for information searching or its reorganisation. However, the conditions of distance learning created a serious barrier. The appointment of a supportive learning companion was one of the ways discovered by the English teacher for co-constructing knowledge. Teacher Alma suggested completing an English vocabulary exercise in which the students were required to choose a word to describe a given headword (noun) according to its meaning. It was explained to the students that this was pair work. One of them would try to choose the appropriate word or phrase, whereas the other would observe whether the task was completed properly. The first learner was allowed to ask their partner for help at any time. However, assistance might not be needed if the first student managed to solve the assignment independently.

> The assigned pair: Justė and her assistant Augustina. Justė chose the correct words: 'Bright bathroom'. Augustina's help was not needed. Then, Augustina had to perform the task, and Kotryna had to help her.
> Augustina: *Maybe 'trade world'.*
> Teacher Alma: *Possible, but not very good.*
> Augustina*: I need help.*
> Kotryna: I … *don't know.*
> Teacher Alma: *What's the English translation for 'žinomas pasaulis'?*
> Kotryna: *Known world.*
> Teacher Alma: *Now, it's Steponas' turn. And Tadas is his assistant.*
> Steponas: *I've written 'a known fable'. But 'known' has already been used.*
> Teacher Alma: *What kind of fable is also possible?*
> Tadas: *A popular fable.* (Observation, 27)

Working in pairs, students feel safer and know that they may get support if needed. They share responsibility. The learning companion, who is assigned to provide help, is attentive, listens to the choice of the first student and hurries to provide help if necessary. Students find themselves in a dual position—of one who can ask for help and one who can provide it (i.e. an expert). Such a kind of scaffold, according to the teachers, is efficient for all students: '*Even the weaker one can help the stronger student. I've noticed that it works. You do not necessarily have to group the capable students with the weaker ones. Somewhere an idea comes to the student's head: "I can. I'm able to"'* (Reflection with teacher, 27). These scaffolds help

students as expert learners to understand when they reach the limits of their own knowledge and ask for help. Moreover, students learn to assess the correctness of the information provided by others.

Collective Systemisation of Information Seeking as Big a Personal Contribution in the Context of Distance Learning as Possible The goal of the lesson was to systemise students' knowledge of the adverbial participle in the Lithuanian language. Seeking to make students active participants in the lesson and encourage them to present information themselves, the teacher suggested playing the game 'Totalizator'. The whole class, as one team, was asked to present all the information about the formation and usage of the adverbial participle. However, personal contributions were also taken into consideration—pluses were written for correct answers, and it was possible for a holder of five pluses to get ten points. This activity required the following cognitive strategies of the expert learner: to remember what they knew about the adverbial participle and communicate this information out loud; to keep in mind that the repetition of information could earn a student a minus; when the majority of the information was given, to think about what was left unmentioned. The students were very active.

> Tadas and Gritė said together: *They have tenses.*
> Teacher Goda: *The correct answer is assigned to Tadas and Gritė. You get a plus each.*
> Ieva: *It has suffixes.*
> Teacher Goda: *Can you specify what suffixes it possesses?*
> Ieva: *They are the same as those of the half-participle, -ant and -us.*
> Teacher Goda: *Correct, only these two, right? The soft sign can be added.*
> A short pause. The students are thinking. Teacher Goda: *Who else knows something about adverbial participles?*
> Sofija: *It is not declined and conjugated. … It only has a tense form, nothing else.* (Observation, 28)

At the end of 'Totalizator', the teacher revealed the summarised table of adverbial participle formation and usage. The students had the opportunity to see that joint efforts enabled them to systemise all the information on adverbial participles and feel like real expert learners. In a way, the principles of 'Totalizator' turned learning upside down—it was not the teacher who presented the systemised information but the students, who remembered, thought over and systemised this information together (the teacher scored the students' answers, made minor specifications and asked questions to stimulate thinking wrong answers over). The game encouraged students' thinking, activity and attention concentration and proves that, under conditions of distance learning, teamwork, when the common goal is set for the whole class, is also possible. On the other hand, a limitation of distance learning on the learning platforms was that it was impossible to group students into sub-groups to communicate with each other. In Lithuania, this technical problem was addressed only after the research was conducted.

7.5 Overcoming Learning Barriers While Becoming a Knowledgeable and Resourceful Student

During the research, the learning barriers encountered by Maikas and Timotiejus became particularly apparent. It was noticed that these two students encountered problems related to information perception and processing.

Maikas lives in a family where only Russian is spoken. However, his family decided that the boy had to attend a kindergarten with Lithuanian as the language of instruction and later a Lithuanian school. The boy learnt the Lithuanian colloquial language very quickly and is able to use it very well but learning of Lithuanian and the English language in particular, causes difficulties to him. Teachers see bilingualism as one of the essential reasons for the learning problems faced by this student.

Timotiejus, just like Maikas, encounters problems related to the use of language. However, the reason for his problem is hearing impairment, which is compensated for by a cochlear implant. Although the report on the standardised assessment of special educational needs emphasises that Timotiejus is characterised by good concentration, visual discrimination and persistence in attaining results, his learning is impeded by a low level of vocabulary understanding, verbal awareness and difficulties seeking to express abstract ideas in words. His language is grammatically incorrect.

Expressing Identification of a Favourable Learning Method and Its Application While Overcoming Educational Barriers While planning education, the teachers who apply the UDL approach foresee possible barriers and plan ways of coping with them in a targeted way. Classical scaffolds for removing barriers to listening and language perception are related to presenting information through visual, tactile, and other sensory modality channels. Means, ways and assignments of various types that target thinking and creative application of knowledge in various contexts are of particular importance to language comprehension and memorisation.

Selective perception, which emerged during this research, refers to the student's ability to adapt to the current situation. Modelling the attitude towards one's own learning enables the student to access the information that is available to him/her at this particular moment.

At the beginning of the observed English lesson, the students revised the spelling of verbs and wrote down some examples. Later, the whole lesson aimed at the analysis of formal and informal letter writing. While analysing this topic, the written texts were used and teacher-pupils discussion was held. Although the written texts were assigned through methods that complied with the needs of Timotiejus, the language used during the lesson created a serious obstacle for him due to its complexity. The material used for revision of grammatical forms and a way of learning that is convenient to him (combination of commenting and writing down) allowed him to understand and memorise information. Despite the fact that the spelling of verbs was revised shortly at the beginning of the lesson, Timotiejus emphasised this aspect as an outcome of his activity after the lesson was completed.

Timotiejus: *I remember writing verbs -ing and to.* (Observation, 3).

This evidences the relevance of scaffold versatility and concern for student's needs, which can be achieved with the help of student's reflection on own learning. It is obvious that a classic scaffold (visualisation, in this case) is not always a sufficient method for understanding basic information. Although the student, who perceives his or her own learning activity and possesses a positive attitude towards learning, is able to use at least part of the information accessible to him or her, selective perception of information creates considerable gaps in the process of the student's learning.

In the meantime, by employing his/her ingenuity and creative powers, the teacher can constantly saturate the daily leadership of the educational process with scaffolds that enhance understanding and memorising. For example, vivid linguistic expressions may be related to content meanings in a targeted way:

Teacher Alma: *If the action – zap! - happened one time. What tense do we use?*
Gritė: *Past Simple.*
Teacher A: *If we want to say that something happened at indefinite time in the past* (she says slowly and prolongs the words*), we will use Past Continuous*. (Observation, 24).

Emotional and meaningful expression during dialogue with students helps to attract their attention and, observing the teacher's emotion, allows them to link the rhythm of language and time flow and to differentiate the meanings of discussed grammatical forms of verbs.

Confidence-Based Collaborative Environment in the Processes of Overcoming Barriers The application of UDL in the process of learning encourages the creation of relations that are based on confidence and mutual support. Such relationships enhance the equal participation of all students and become a scaffold for the perception and application of knowledge. The research results revealed that the freedom of thought expression of a student with special educational needs is strongly influenced by a clear feeling of interpersonal confidence, which neutralises the fear of making mistakes and ensures the status of a full member.

UDL embraces the possibility of employing different ways for a collaborating student to receive and share necessary information with others. The tasks that are integrated into the contexts close to the students enable their understanding of knowledge adaptability and its free use.

In the observed lesson, the Lithuanian teacher used the method 'Carrousel' to consolidate the students' knowledge of active participles. The students formed teams of four members. Each team sits at separate desks. Different tasks oriented towards the lesson goal are put on every desk. The tasks are performed in stages. A leader is appointed for every stage. In such a way, every student is provided with opportunities to be a leader of learning activity. Five minutes were assigned to one task. After five minutes, the teams write down an evaluation of the work of the leader and the whole team on the instruction sheet and change their place sitting down to another desk to perform another task.

Vaida is the leader of the first assignment in Tomotiejus' team. Tomotiejus is the leader of the last stage of assignment. The students at the first desk clarified the suffixes of the participles and searched for information in the textbook. Timotiejus does not express his opinion. He joins the team, only providing feedback on their work. The team moves to another desk. The leader of the stage changes, and Marija becomes one this time. She encourages Timotiejus to engage in the activity.

> Marija: *Timotiejus, help us, too. How do passives look to you?*
> Timotiejus: *These are passives.*
> Timotiejus expresses his opinion and divides participles into active and passive ones, showing where they have to be written down. When teams move to another desk, the task is to create an advertising slogan using passive participles.
> Vaida: *We want to create a slogan about shampoo …, it washes your hair well and is easily rinsable.*
> Timotiejus hardly joins this creative activity but he reads the text. When the team moves to one more desk, Timotiejus becomes the leader of the assignment to demonstrate passive participles.
> Timotiejus: *Do we have to act now*? – he double-checks, asking the teacher.
> Marija: *Now you will have to act*.
> Timotiejus: *All right, I'll do it*.
> The brainstorming of ideas for performing is held.
> Timotiejus: *Is frying, fried*.
> This suggestion is not correct.
> The girls change it to: *Frying omelette ... You have to use a passive participle*.
> The students further elaborate on the idea and find a correct form of the participle: *Fried omelette* [the omelette which is being fried at the moment].
> The teacher joins the discussion.
> Teacher Goda: *And how can you show fried omelette?*
> Timotiejus is very active in thinking of how to realise this idea that all thought of and eagerly plays it. (Observation, 9).

Upon completion, the students evaluated the lesson as very efficient. In this case, all the students were offered one method 'Carousel'. However, its implementation is grounded in various components that align with students' needs. Equivalent motivating status in the team, when each member assumes delegated responsibility (each member is the leader of stage and participants) equally, enhances their self-esteem and interpersonal trust. In this particular case, a student with language perception difficulties received numerous remarks from his peers, but he felt as an equal learning partner, not experiencing the status of the weaker. Even when he made an obvious mistake suggesting verbs 'is frying, fried' instead of the required participle, in the situation of the search for ideas, it became an excellent way for him to follow the logic of the thought, changing the verb to get the forms of participles they were analysing 'is frying, fried > frying > fried'.

Using the usual learning aids, such as textbooks, internet on the phone, material prepared by the teacher and knowledge of other learners, conditions are created to employ senses of different modalities analysing and perceiving information, such as sight (while reading), hearing (while listening) and kinaesthetic (while acting) ones. The students adapt to every single case, perceiving, processing, and expressing their knowledge (it is difficult for Timotiejus to create a slogan because it requires

complex linguistic constructions, but he looks into it while reading the outcome of their joint activity to himself and others).

A possibility of changing the sitting position and moving from one desk to another not only encourages students to keep track of time while working (pupils change every five minutes) but also increases the possibility of hearing and comprehending information. The students evaluated this lesson very well not only because they were provided with numerous occasions to deeply understand the essence of the analysed phenomenon, but also due to the experienced joy of learning.

Collaboration consistently coordinated by the teacher can serve as a scaffold for coping with a learning problem. Having created collaborating groups or pairs, the teacher foresees tasks for certain pairs and thus creates conditions for perception and ensures the prevention of failure.

> Teacher Alma: *Sofija and Timotiejus are now going to answer together*.
> Sofija (one of the smartest students) clarifies in Lithuanian that this sport is played in teams.
> Teacher Alma: *Timotiejus, do you know any kinds of sports that are played in teams? Do you know anything else*?
> Maikas suggests his variant.
> Timotiejus: *Then, baseball*.
> Teacher Alma: *Now Sofija, together with Timotiejus, is trying to think of the sixth question*.
>   Sofija formulated a question.
> Teacher Alma: *Timotiejus, do you agree*?
> Timotiejus: *Yes, sure* (he answers in English). (Observation, 29)

It is obvious that the collaborative situation allows for creating conditions for providing assistance to the weaker student without putting emphasis on differences in his/her skill level but assigning tasks accordingly. One of the academically strongest students and the one facing difficulties perform the same role, but in this case, the assignment is more favourable to the weaker learner. Being interested in sports, the boy immediately thinks of the answer and presents it in English. Meanwhile, the assignment, which requires thought modelling and its expression, is given to both learners, foreseeing that sharing ideas will play a significant role of scaffolding. When Sofija formulated the question, Timotiejus only had to think it over and approve or disapprove of it. The smooth completion of assignments is enhanced by the teacher's and students' inserts in Lithuanian. This information in Lithuanian serves Timotiejus and other students as scaffolds for a better understanding of used vocabulary as well as the content of assignment and implemented activities.

Student-to-student support and the role of support provider assigned to a student, who regularly encounters learning difficulties, enhances his/her self-confidence and activates responsibility for correct decisions while completing the task, not only from his/her own perspective but also from that of the friend s/he acts with.

> Teacher Alma: *Timotiejus, can you start now? Maikas, can you be a helper?*
> Maikas: *Well, I'll try, I'll try.* (Observation, 30)

The assignment that expresses the teacher's confidence helps the student, who experiences attention management problems and constantly seeks acknowledgement and social relations with others, mobilise inner powers for targeted information processing. According to the teacher, peer support performs two important

roles in the process of becoming expert learners. On the one hand, this is a very efficient way to overcome learning barriers in individual relations; on the other hand, it identifies one's own inclinations and enhances social relations.

> Teacher Alma: *But you sometimes see that in this particular topic, for example, Jonas can help Timotiejus a lot because he is able to explain in a structured way. He has a gift of teaching. He really enjoys explaining something to his friends. And when you hear Timotiejus speak in Jonas's sentences, which are more fluent and richer, you understand that collaboration succeeded.* (Reflection with teacher, 30).

Situations of students' collaboration establish social links and influence the development of self-control skills. Favourable emotional background in a supportive learning environment enhances volitional and perseverance powers. Even in the cases, when academically challenging the content of the lesson as if provokes a retreat, the student finds internal powers for volitional concentration on cognition and participation. During the distance lesson, '*Maikas stands up, sits down, goes somewhere away and then immediately returns back*'. (Observation, 25). It is obvious that overcoming barriers associated with social relations tends to strengthen not only cognitive processes, but also those of self-control while learning.

It should be considered that the phenomenon of support during collaborative learning is a highly sensitive issue related to students' self-esteem. The support provided by the teacher and students is approached differently by the receiver.

> The researcher: *When you were standing in the circle and the children asked you questions, did you understand all the questions*?
> Timotiejus: *The teacher helped me and explained it to me*.
> The researcher: *Did you feel good when the teacher explained it to you?*
> Timotiejus: *Yes*.
> In relation with peers, he acknowledges the support from friends, but he also tries to emphasise his equal relation with peers and his contribution.
> Timotiejus: *...when Jonas helped me ... friends help me ... We discussed a little bit and thought together, which word to write there ... We helped each other.* (Reflection with student, 6).

The results of this research show that direct support to a student in the presence of other students can be relevant to a learner. It does not embarrass this learner because not understanding something is perceived as a natural phenomenon and the applied solution to this problem is the teacher's support. The student evaluates help from peers differently. The learner accepts and appreciates it but assigns it to a certain form of collaboration, because accepting this support means accepting the role of the weaker. To avoid this, the student is sensitively concerned about his equal status and emphasises his own help to his friend.

When learners' physical and cognitive capacities differ, equal relations are grounded on two conditions: (1) educational activities are equally accessible to all learners; (2) a phenomenon of support is treated as a natural part of the educational process without any negative connotation.

Expression of Latent Barriers in Cognitive Processes The beginning of the third cycle of action research was marked by new external challenges caused by the COVID-19 pandemic. After the universal quarantine was introduced, schools in

Lithuania were closed, and distance learning started. This new learning experience became a challenge to students as well as teachers. However, researchers' observations of online lessons and discussions with teachers allowed the revelation of the existence of latent barriers. Such latent barriers divert the teacher's attention to their consequences and prevent them from identifying the real essence of a student's failure.

Assigning learning barriers to social circumstances is a frequent characteristic of wrong decisions. When distance lessons started, Maikas and Timotiejus demonstrated signs of passive participation. They joined the lessons but did not show any signs of active involvement and were hiding their faces behind profile pictures. Maikas hid himself behind Hitler's face, whereas Timotiejus' profile had a picture of loudly screaming Trump. Such masking of students is a signal to the teachers about their wellbeing. The teacher and the researchers held reflections after each observed lesson. Such a position of learners was considered a sign to conduct a deeper analysis of the nature of possible barriers and variants of eliminating them. During the lessons observed earlier, it was noticed that after the public failure, Maikas starts behaving in a destructive way but does not withdraw from the learning process.

> Researcher: *I've noticed that Maikas possesses a lot of leader's qualities. Maikas' character is his strength. However, he cannot cope with a failure or defeat, and that is why he just confines himself or starts behaving bad. ... Perhaps he is also afraid of publicity. Maikas clearly demonstrated that. The teacher asked, he disconnected and then connected again.* (Reflection with teacher, 25).

The student's behaviour demonstrates the fight between the character's expression and his wellbeing. His character encourages active engagement during lessons and a wish to learn together with others, but his fear of public failure is likely to create certain barriers. External identification with Hitler, a strong but universally condemned personality, allows him to draw attention to himself and express his resistance to the situation that suppresses him. Meanwhile, the teacher focuses more on external reasons and thinks that they can account for Maikas' avoiding learning without linking it with learning barriers.

> Teacher Alma: *It would be simpler if the parents hadn't sent him to a Lithuanian school because he constantly protests against Lithuanianess.*
> Researcher: *English is not Lithuanianess. He wants to be a leader, but he doesn't succeed and then, knowing more about Russia, he tosses related phrases. With his character, it is important to show niches for his leadership.* (Reflection with teacher, 25).

The analysis of the situation confirms the link between the educational environment and the use of student's learning powers. Limiting possibilities for student's self-expression, the environment inhibits prerequisites for student's cognitive activities and evokes his/her non-traditional behaviour, which complicates the search for educational solutions while creating learning scaffolds.

The situation of Timotiejus is different. The reason for his learning problems is obvious—limited language comprehension due to impaired hearing. However, the problems of active participation in lessons are very similar to Maikas, the student

discussed above. Social reasons are emphasised during the reflection with the researchers, and in this case by the teacher.

> Teacher Alma: *In his family, they communicate with Timotiejus via SMS because it is more convenient to him. Then, how does his language develop?*
> Researcher: *Mom thinks that she answers the child's needs, but she doesn't realise that it impedes her child's language development.*
> Teacher Alma: *Then it is clear to me why his Lithuanian isn't developing, not to speak of English.*
> Researcher: *It is important to provide him with knowledge during lessons. He is hiding behind Trump, Superman. He suffers from inferiority.*
> Teacher Alma: *No one bullies him in the class. If there is such an attitude in the family, then it's a situation without a solution. His mother doesn't target his higher academic achievements*. (Reflection with teacher, 26).

Hardly understandable behaviour of the students encourages teachers to retreat, seeking to share responsibility with other participants in education, that is, with the students' families. However, the results of the observation evidence problems with the learner's wellbeing, which not only limits his language development but also hinders his participation in cognitive processes. The discussed behaviour of Tomotiejus' mother could be considered a suggestion to increase accessibility of information for this student.

Scaffolds for coping with latent barriers encourage a teacher to flexibly change decisions, directing scaffolds to the identified causes. After the comprehensive analysis of students' behaviour, the teacher attempts to create conditions for students' successful learning experience. The teacher used Maikas' character features as scaffolds for strengthening his language perception. His wish to be noticed is constantly enhanced by allocating attention to him, talking to him and inviting him to be a teacher's colleague.

> Teacher Alma: *Maikas, can you help me? Choose one year, and say it*. (The teacher assigns the task in English).
> Maikas: *Shall I choose one year?* (He clarifies the task in Lithuanian and says the year in English).
> Teacher Alma: *Ok. Last time we revised that we say the year as two numbers*.
> Maikas: *Oh, as two numbers*. (Maikas corrects himself). (Observation, 34)

The teacher constantly uses similar methods, demonstrates confidence in the student and assigns the tasks that the student is able to cope with. The student's emotional state and self-expression enhance his self-esteem, promote concentration of attention, and search for forms of comprehension favourable to him. Maikas offers to do the assignment first all the time; when something is not clear, he bravely asks the teacher. The teacher does not avoid emphasising his success and praising him. The main obstacle, that is, avoidance of participating in the process of learning, has been overcome. The changes in the emotional state are confirmed by some decorative elements on his screen—merry animated children's pictures. During the remaining period of observation, Maikas participated in the lesson, always connecting properly. He did not use any means to attract attention, but bravely clarified all the unclear things.

Timotiejus still does not do his homework, hides behind different backgrounds, and hardly talks during lessons. Being asked directly by the teacher, he provides abstract answers unrelated to the analysed topic. It is obvious that the student does not understand what is being analysed during the lessons. The teacher asks Timotiejus to stay after the lesson to talk with him about his future learning. Timotiejus does what he is asked to.

Teacher Alma: *Timotiejus, can you switch on the sound? Don't you have the camera?*
Timotiejus: *No, I don't.*
Teacher Alma: *I only see your knight's armour. I don't have your story or separate words. What has happened to you?*
Timotiejus: *I don't know, it's slightly complicated for me to find out.*
Teacher Alma: *Yes, but you have to try. Now, look. I'll show to you how to work with that ... Have you seen this one?*
Timotiejus: *I don't know, oh, I don't know.*
The teacher keeps opening one assignment after another and explains to the student how to complete them.
Timotiejus: *Oh, this one. Yes, I know it, but I haven't done it yet.* (Observation, 23).

The teacher explains every task separately. She receives the promise from Timotiejus that he will do all the assignments, but the teacher is not sure if this conversation is fruitful, because it is not the first attempt to provide individual consultations to him. During the reflection of the researchers and the teacher, organising meetings with the student before the lesson to explain the main concepts was suggested, which will be used soon, as well as problems, which will be analysed during the lesson. It was also recommended that Maikas is invited to the meeting, as he exhibits similar problems. The teacher agrees with this. During the discussion, there appear to be some doubts if the student knows how to use the online learning platform employed during lessons. However, the teacher ensures that the platform is used for the organisation of all the lessons. Before the start of distance learning, the school organised special training courses to all the students and explained the rules of using 'Google Classroom'.

The teacher invited three students, including Timotiejus, to a morning consultation. However, before the lesson, Timotiejus did not connect. During the reflection of the researchers and the teacher, it was assumed that not only the lack of skills but also his well-being became learning barriers for Timotiejus. Seeking to encourage the student, the use of a mediator was decided. One of the researchers wrote a letter to Timotiejus, where she expressed confidence in him, understanding of the situation he is in now, and invited him for an open reflection about the encountered difficulties. After the lesson, the teacher invites Timotiejus for a conversation about the possible ways of helping him.

Teacher Alma: *Can we see your face instead of this politician? ... Oh, ok. Now it better.*
Teacher Alma: *Timotiejus, what problems do you face, what is complicated to you while doing homework?*
Timotiejus: *I don't manage to do it. You assign too much homework. I don't manage on time. One day I do homework, then I don't manage to do, then again.* (Observation, 23)

The teacher opens 'Google Classroom', and showing specific assignments, demonstrates the tools that can facilitate completion of these assignments. Timotiejus

claims that he sees a totally different view on his screen and does not have such tools at all. It turns out that the student does not possess sufficient knowledge of the main learning platform. It is obvious that scaffolds for eliminating barriers of language comprehension, which were not provided on time, resulted in the emergence of other barriers, which affect not only understanding of knowledge but also the student's self-esteem. Solving the basic problem of managing learning tools, the student's situation started to change slowly. The support provided to gain basic skills not only opens paths for cognition but also promotes the expression of the student's strong personal qualities. Timotiejus' retreat and withdrawal have been replaced by his determination to seek results, good concentration, and thinking.

Teacher Goda: *I appreciate the children's initiative. Timotiejus chose such a complex grammatical form. I think: "You are entering such a difficult fight". But he analyses and thinks together with other children.* (Reflection with teacher, 37).

The identified latent causes of barriers and reactions to them not only eliminate their direct consequences but also activate the student's inner powers, possess knowledge and create favourable conditions for discovering ways to overcome the lack of certain qualities and increase the teacher's self-confidence and trust in the student.

Teacher's Dispositions, Barriers and Directions for Their Overcoming The teacher's dispositions are formed not only by the inner experiences of the student and the teacher but also by the conditions within the educational environment. The national, regional or school policy and the requirements imposed on learning outcomes can become a serious obstacle for building up an inclusive disposition of teacher. The teacher considers the priorities of the whole educational system and the prevailing forms of education.

Emphasis on school prestige and academic results in the community, as well as school ratings based on academic achievements, enhance and highlight differences in students with learning difficulties. The anxiety about the possibility of successful education of students with learning difficulties without worsening the general academic results of school and those of gifted students disturbs the teacher's disposition.

Teacher Goda: *The results of international surveys (TIMS and others) show that our school exceeds the national average, and we want to retain this level. The entrance exams to the lyceum will come, and it will be of importance to 8th graders.* (Reflection with researchers, 36)

After basic school, students will pursue education in gymnasiums. Therefore, requirements and ways of education that prevail in gymnasiums make up a relevant criterion for teachers while modelling education in their classes. The load that is hard to cope with hinders students' efforts to search for knowledge and creates new models. The teachers' ideas while planning the education that enables a student to become an expert are also obstructed.

The anxiety regarding compatibility of possibilities for students with different capabilities while striving for successful education of every learner and focusing on separate groups of students promotes teachers' empathy. However, the question

emerges of how to ensure enough time and space for search, cognition, and development of the learning powers of gifted and less gifted students.

> Teacher Alma: *It is difficult for them in this class because there are many smart students, 'nuggets', and it is complicated for the boys to show themselves.*
> Teacher Goda: *It is a very creative class. When you give a possibility, they open up wide. I cannot finish the course of folk sons, which was supposed to be boring. Now they are singing with scenography.* (Reflection with researchers, 36).

Although creative activities establish conditions for each student to reveal their own individual powers, the environment, which allows for their demonstration, is very important. The learners' ability to share roles and to attain common goals are of crucial importance in establishing learning opportunities for learners with special needs. It is natural that dissimilar powers of students' engagement predetermine the different expressions of jointly pursued results. While evaluating the result, the dilemma over the application of standardised criteria-based reference points is confronted. If they are applied, students with learning difficulties are prevented from getting a high mark. However, another dilemma regarding justice to all students in the educational process arises if the teacher does not introduce the standards. It is obvious that facing the students' diversity, the teacher also encounters his/her internal attitudinal barriers, which may also build barriers for students.

> Teacher Goda: *Timotiejus didn't sing either, though he has a very strong beautiful voice. Do I have to press Timotiejus?*
> Researcher: *Sometimes alternatives are needed. If I had to stand in front of the class and sing, I wouldn't sing because I would be afraid to make a fool of myself. They also need alternatives: to sing, to read poetry, to record singing at home and play it during the lesson, or to replace a practical assignment with a theoretical one.*
> Teacher Goda: *Timotiejus sings. Then what about the learners in the class? Won't they be embarrassed?*
> Researcher: *Well, we are learning to use alternatives. We should speak more with the children about it.* (Reflection with teacher, 14).

Reflection on the educational process is one of the most significant components of UDL approach. This component is also of utmost importance when building up the teacher's disposition. The research results show that open, collegial collaboration of teachers in the stages of forming inclusive experience of teacher who employs the UDL approach allows verifying own decisions, finding appropriate interpretations of situations, and is a relevant indirect scaffold for teacher to overcome barriers and change his/her disposition.

The teacher's disposition that supports a student comprises an important scaffold for compensating for external circumstances. During the action research, the teachers' disposition that accepts the students' diversity developed. It allows finding ways to create a barrier-free environment, thus providing all the students with conditions to reveal their personalities and, without violating the principle of justice, makes it possible to implement the principle of non-discrimination in education. The teacher's disposition that is based on trust in students creates a collaborating teacher–pupil relationship, which is very important for enhancing student's self-confidence while pursuing the best academic result. The support clearly expressed by the teacher significantly contributes to the maintenance of this relationship.

In the collaborative relation, even an inappropriately and irresponsibly completed assignment can be turned into a learning-to-learn tool, which helps a student to bravely and responsibly model information, not to be afraid of own mistakes and to learn from them.

> Teacher Alma to Maikas: *You've been very actively engaged in our activities and it makes me very happy. You also have been doing various artistic things but if you could improve one of your works....* (she gives the exact name of work).
>
> Maikas: *Mhh* (without enthusiasm).
>
> Teacher Alma: *I have a copy paste variant. It isn't yours... Have one more look at and correct it according to requirements so that I could evaluate it. Is it ok?*
>
> Maikas: *Good* (with enthusiasm).
>
> Teacher Alma: *Do you any questions?*
>
> Maikas: *No* (he answers in English and says goodbye to the teacher in a polite and vigorous way). (Observation, 37)

The confidence in the student expressed by the teacher and the suggestion of a specific tool for improving the completed work instead of emphasising his unwillingness to learn directs the student towards pursuance of the correct result, which is attained through conscious knowledge analysis and its modelling. The student's success achieved in the collaborative relationship is a strong catalyser for the student's cognitive activity and for the enhancement of the teacher's inclusive competences. For the teacher, who tends to constantly reflect on his or her own activity and to develop an expert leaner, finding the answer to the question 'How does the student learn?" is as important as answering the question 'What has the student learnt?'

The supportive/scaffolding targeted and constantly reflected teacher–student relationship becomes a relevant marker in the process of successful learning. The analysis of barriers to information processing and its use, which are faced by two learners with more serious learning peculiarities compared to others, confirms the key principle of UDL that barriers to learning, which promote the student's becoming an expert learner, lie in education organisation decisions, curricular and aids rather than in individual differences of learners (Meyer et al., 2014). The results of the analysis also confirm the conclusion of Meier and Rossi (2020) that individual barriers tend to decrease by themselves after skill and curricular barriers are eliminated.

7.6 Discussion and Conclusions: Links of Inclusive Education Factors to Resourceful and Knowledgeable Learners

The results of the action research allowed us to conclude that while educating a resourceful and knowledgeable student, the teacher also thinks about the students' learning and, on this basis, plans, and organises the process of inclusive education. The teacher's belief that every student can become an expert learner in information perception, use of language and symbols, information comprehension, as well as

the learning process organised in a targeted way creates conditions for expression and development of qualities and abilities assigned to expert learners. Significant changes in the student's becoming an expert learner have influence on the teacher's disposition—she or he increasingly believes that every student, even with SEN, can become an expert in information perception, reorganisation and comprehension. The research results show that application of the UDL approach facilitates development of practices that help teachers to increase opportunities for all students (including those with SEN) to become learning experts, that is, actively perceiving learners who construct their own deep comprehension, are self-directed, and are ready to create and co-create their knowledge. Improving their learning expert abilities, students more actively engage in the process of co-learning and experience greater learning success. Thus, application of the UDL approach increases the quality of inclusion for all.

The analysis of lesson observation and reflections of students, teachers and researchers disclosed the qualities and abilities of students as expert learners manifested and improved and what inclusive educational practices became a favourable context for their development. The generalised results of action research on the student's becoming an expert learner applying the UDL approach are presented in Fig. 7.4.

Organising inclusive education within the UDL approach and under conditions of students' constant reflection on their own learning process, their ability to choose and employ the information of the most favourable modality for their perception became more and more visible. The significance of emotional background for an in-depth understanding of new information, formation of cognitive relations and attainment of learning success became particularly apparent. The data obtained in the research conducted in another area by García-Campos et al. (2020) also confirmed the importance of emotional background and emphasised the influence of emotion-based choices on the efficiency of executive functions. Our research results added new data to the knowledge that a favourable emotional inclusive learning background stimulates students' ability to understand how an emotional inclusive background helps them think and manage processes of their own perception and change behaviour while learning. The obtained data confirm the theoretical assumptions of Mayer et al. (2011) that emotions can be assimilated to thinking, prioritising efficient ways of thinking and relying on reasoning.

According to the data of our research, the construction of students' deep understanding was encouraged by applying various thinking tools, knowledge organisers, additional support methods, procedural steps and deep scaffolding strategies. This encouraged every student, including the one with SEN, to approach newly received information from different perspectives, to use different ways to reorganise, systemise new and already possessed information and to envisage meanings and essential ideas. Some research also shows that authentic instruction, including personally and socially meaningful contexts (Preus, 2012; Gronseth et al., 2020) and sharing thoughts with peers while discussing (Moore et al., 2020), encourages SEN students to construct their deeper knowledge. Applying the UDL approach, it is possible to
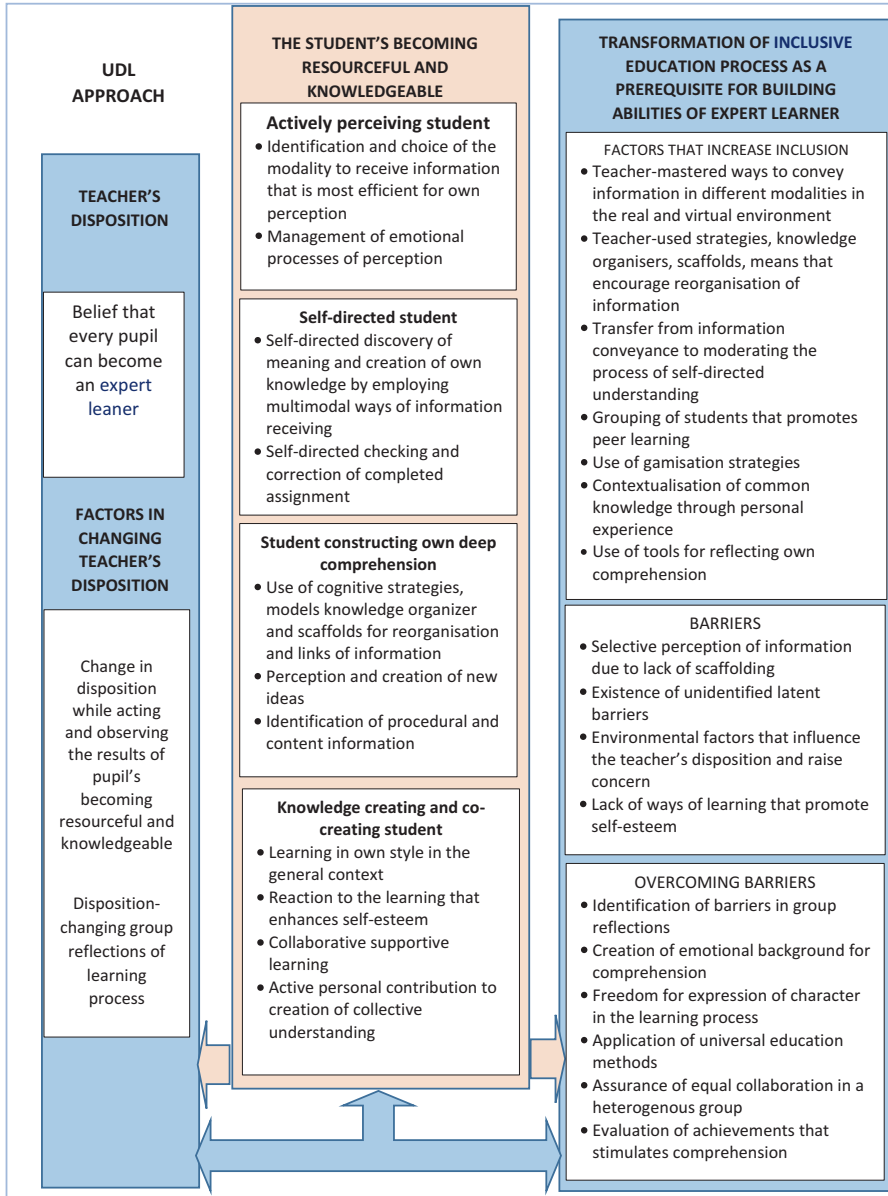
UDL APPROACH

TEACHER'S DISPOSITION

Belief that every pupil can become an expert leaner

FACTORS IN CHANGING TEACHER'S DISPOSITION

Change in disposition while acting and observing the results of pupil's becoming resourceful and knowledgeable

Disposition-changing group reflections of learning process

THE STUDENT'S BECOMING RESOURCEFUL AND KNOWLEDGEABLE

Actively perceiving student
- Identification and choice of the modality to receive information that is most efficient for own perception
- Management of emotional processes of perception

Self-directed student
- Self-directed discovery of meaning and creation of own knowledge by employing multimodal ways of information receiving
- Self-directed checking and correction of completed assignment

Student constructing own deep comprehension
- Use of cognitive strategies, models knowledge organizer and scaffolds for reorganisation and links of information
- Perception and creation of new ideas
- Identification of procedural and content information

Knowledge creating and co-creating student
- Learning in own style in the general context
- Reaction to the learning that enhances self-esteem
- Collaborative supportive learning
- Active personal contribution to creation of collective understanding

TRANSFORMATION OF INCLUSIVE EDUCATION PROCESS AS A PREREQUISITE FOR BUILDING ABILITIES OF EXPERT LEARNER

FACTORS THAT INCREASE INCLUSION
- Teacher-mastered ways to convey information in different modalities in the real and virtual environment
- Teacher-used strategies, knowledge organisers, scaffolds, means that encourage reorganisation of information
- Transfer from information conveyance to moderating the process of self-directed understanding
- Grouping of students that promotes peer learning
- Use of gamisation strategies
- Contextualisation of common knowledge through personal experience
- Use of tools for reflecting own comprehension

BARRIERS
- Selective perception of information due to lack of scaffolding
- Existence of unidentified latent barriers
- Environmental factors that influence the teacher's disposition and raise concern
- Lack of ways of learning that promote self-esteem

OVERCOMING BARRIERS
- Identification of barriers in group reflections
- Creation of emotional background for comprehension
- Freedom for expression of character in the learning process
- Application of universal education methods
- Assurance of equal collaboration in a heterogenous group
- Evaluation of achievements that stimulates comprehension

Fig. 7.4 Interaction of inclusion-increasing factors of the student's becoming resourceful and knowledgeable when applying the UDL strategy

include all the ways that contribute to the efficient construction of students' deep understanding.

Our research substantiated that UDL-based education, which enabled the teacher to assume the roles of moderator and facilitator, promoted students' self-directing learning. The students took the initiative to clarify new information, demonstrating responsibility for their own learning and applied and reflected cognitive processes, which helped to better understand the learnt material. Our research results, similar to those reported by Raley et al. (2018), show that even students suffering from learning disorders can acquire skills of self-directed learning in an appropriately created context. Although in the action research the teachers did not specially teach skills of self-directed learning to their students as it was done by Raley et al. (2018), consistent reflection on their own learning goals, process and outcomes enabled the students to improve these skills. This insight is confirmed by the conclusion of Schweder's (2020) research that learning in a student-centred educational environment encourages self-directed behaviour, use of self-control strategies and larger effort investment.

Another result of our research revealed the processes of collective comprehension in the context of collaborative learning. We established that in supportive collaborative inclusive activities, the strong qualities of each participant are employed to create collective understanding and common knowledge, thus enriching collective understanding. The cycle of improvement in the situation of collaborative learning suggested by Fisher et al. (2020) starts with improvement of individual abilities, ends with improvement of group skills, and then moves to individual skills again. Morocco et al. (2001) emphasised the importance of SEN student's engagement in discussions with classmates, and Moore et al. (2020) affirmed their use of comprehension strategies through peer-mediated collaborative groups. Our research shows that processes of creating collective understanding in heterogeneous groups can be strengthened when favourable inclusive educational conditions are created, for example, by using the UDL approach.

The results revealed the educational barriers that prevent students from full participation in the educational process and the development of abilities assigned to an expert learner. Meyer et al. (2014), Zhong (2012) and Meier and Rossi (2020) emphasised an unfavourable educational environment, limitations of accessibility to curriculum, lack of learning skills among students and their personal qualities as a reason for the emergence of such barriers. Our research revealed the barriers impeding the formation of teachers' dispositions that are open to the students' diversity. According to Barnes (2019) and Weiss et al. (2019), such disposition is essential for establishing an inclusive community of students and teaching the study subject. Our research allowed us to identify the tension between the child-centred disposition of teachers and loyalty to the educational system, which focuses on quality based on standardised students' achievements. This tension blocks inclusive values of teachers: belief in every students' possibilities (Nieminen & Pesonen, 2020) and consideration of students' diversity while modelling education (Van Boxtel & Sugita, 2019). The limiting impact of focus on standardised achievements observed in

inclusive activities of teachers is also confirmed by the results of previous studies (Florian et al., 2016; Farrell et al., 2007).

The results of our research highlighted the elements of teachers' actions and students' self-efficacy that are of significance in coping with learning barriers. The phenomenon of selective information perception in the process of overcoming learning barriers can be explained through the intrinsic motivation and mastery of students in the context of self-directed learning (Ryan & Deci, 2020). The barrier of language comprehension predetermined by hearing impairment was lowered by the student's awareness of the learning methods that were favourable to him and his motivation to participate. 'Picking' the information from the complex flow of speech that was accessible to him, the student failed to eliminate the learning barrier but was partially able to pursue the learning goal. The teacher's competence to differentiate education is essential while establishing a barrier-free environment for all students (Griful-Freixenet et al., 2020). The results of our research show that the forms of education differentiation may take diverse forms. Teachers who allow students to naturally engage in the process of education are particularly efficient with universal educational methods. For example, when a student discovers a favourable method of learning, such a teacher uses interpersonal support, but the components of education differentiation do not single such a student from the general learning experience. The teacher's disposition that creates an equal collaboration relation with the student and reflective experiences with colleagues in the processing of barrier overcoming supplements the insights of Farmer et al. (2018) about social ecology, which enhances socio-educational relations and is created by 'an invisible teacher's hand'.

The results of the action research showed that teachers' beliefs were built up to acknowledge that every student could become an expert learner within the limits of their own possibilities. During the reflection on the research results, Teacher Alma stated that: 'Development of expert learner is .... Earlier we used to call such children the gifted or bookworms. And now… Maikas can become an expert. It turns out that Timotiejus can also be an expert within the limits of his own possibilities'.

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Chapter 8
A Strategic and Goal-Directed Student: Expectations vs. Reality

Rasa Nedzinskaitė-Mačiūnienė and **Gerda Šimienė**

Abstract The characteristic of an expert learner has recently been widely discussed in the research literature. The expert learner is a learner who is self-directed, self-governed, motivated, resourceful, knowledgeable, able to learn effectively and efficiently, approaches academic tasks with diligence and confidence and employs appropriate strategies to reach the desired academic goals. The act of goal setting is often associated with students' learning-to-learn skills and deeper engagement in their learning process, whereas the choice of appropriate learning strategies increases their capacity to manage their learning. In this respect, the latter aspect – strategic and goal-directed learning of an expert learner – necessitates deeper investigation and analysis. Hence, this chapter presents how we can guide students to become strategic and goal-directed in their learning while striving for the attainment of knowledge and skills, as well as incorporating and applying a variety of learning strategies to optimise their academic performance.

Keywords Expert learner · Universal Design for Learning · Strategic network · Goal-directed student

8.1 Introduction

In today's globalised world, the profile of students and their competencies has changed radically. Moreover, rapid technological development requires a completely different set of skills and abilities than before. That is why, nowadays, student education is more complex than ever before. For modern-day students, it is important to have skills such as critical thinking, the ability to learn, setting and pursuing personal goals and reflecting, etc. Thus, there are different conceptions of students' academic and personal development, for example, self-regulated

R. Nedzinskaitė-Mačiūnienė (✉) · G. Šimienė
Vytautas Magnus University, Kaunas, Lithuania
e-mail: rasa.nedzinskaite-maciuniene@vdu.lt; gerda.simiene@vdu.lt

(Zimmerman, 2002), self-directed (Brookfield, 1985; Van der Walt, 2019), self-governed (Niemi & Jahnukainen, 2020) and other notions of self-learning. Whichever conception we follow, they are all connected with the characteristics of an expert learner. In its broadest sense, an expert learner is one who can learn effectively during the learning process. As Novak (2019) states, an expert learner does not mean the best student; yet, she/he demonstrates interest, motivation and the willingness to assume responsibility for his/her own choices, as well as keeps on trying new strategies until goals are achieved. In other words, regardless of the differences in students' learning, needs and capabilities, the goal is that *all* students should become expert learners.

Currently, Lithuania emphasises the importance of student-centred education at the national level (The National Education Strategy for 2013–2022, 2013). Responding to the learning needs of *ALL* students, not just those who have special educational needs (SEN), becomes one indicator of quality education (The 'Good School' Concept, 2015). It is believed that 'attending to individual student needs is fundamental to improving the effectiveness of curricula' (Rose & Strangman, 2007, p. 388). Besides, the relevance of inclusive education is shown by the proportion of students with SEN in Lithuania's mainstream schools. In 2018, in general education schools, students with special needs accounted for 12.5% (Review on the State of Education in Lithuania, 2019). According to survey data provided in the Review of the State of Education in Lithuania (2019), the number of SEN children in general education, including those of preschool education institutions, is constantly increasing. Therefore, the aim is to create educational conditions for students with SEN in general education schools. Although Lithuania seeks an inclusive education system for *all* students at the national level, the existing practice does not ensure a response to each student's learning needs, interests and opportunities. For instance, the Programme for International Student Assessment's (PISA) indexes of teacher support and adaptive instructions show that, from the students' viewpoint, teachers are still reluctant to provide learning support and/or adjust their teaching processes to students' needs (OECD, 2016). Lithuanian students indicated that they mostly lacked teachers' interest in their learning needs. According to OECD PISA (2016) data, teachers are generally reluctant to change their lessons' structure and activities despite the learning difficulties faced by students. Only 12.3% of students claimed that in each lesson, teachers changed the structure of the lesson when students faced learning difficulties. A similar percentage (12.4%) of students in Lithuania stated that teachers adapt lessons to specific class profiles and needs (OECD, 2016).

At the national level, in response to modern educational realities, the focus is on the inclusion of *all* students in the educational process. It is noteworthy that the national documents (see, e.g. Law on Education, 2011; The National Education Strategy for 2013–2022, 2013; The 'Good School' Concept, 2015) underline the goal to develop students' learning-to-learn competence, their assumption of responsibility for learning, their ability to plan and reflect on their learning, their ability to plan and reflect on the learning process and results as well as their ability to set measurable learning goals. In other words, the goal of educating a strategic and goal-directed student is the priority.

In general, we refer to a student who can learn effectively and efficiently during his or her own learning process, approach academic tasks with diligence and confidence as well as employ appropriate strategies to reach desired academic goals. Strategic and goal-directed students are more likely to plan, monitor, evaluate and take responsibility for their learning process (Van Blerkom, 2012). However, the research on the current state of education (Stonkuvienė & Nauckūnaitė, 2010) and international studies on learners' achievements (OECD, 2017) demonstrate the existing non-compliance between the aspirations and reality of education as well as between desired and real learning outcomes. Thus, considering the findings of international and national research, education policy is focused on student-centred education.

Universal design for learning (UDL) could be considered one of the possible approaches to ensuring a student-centred education system and responding to every student's learning needs, interests and opportunities. Some researchers (Ok et al., 2017; Rao et al., 2014) characterise UDL as a promising framework in different fields and for different purposes. As a result, the UDL framework has gained considerable attention in the field of education. In our case, we view UDL as a useful framework for *all* students to become strategic and goal-directed learners. Within the UDL framework (Meyer et al., 2014), strategic and goal-directed learners are those who: formulate plans for learning; devise effective strategies and tactics to optimise learning; organise resources and tools to facilitate learning; monitor their progress towards mastery; recognise their own strengths and weaknesses as learners; and abandon plans and strategies that are ineffective.

Strategic learning is primarily defined as a learning model that combines skills, will and self-regulation components (Weinstein, 2009). It mainly focuses on the 'how' of learning and is based on a strategic network of the brain that enables the learner to plan, organise, execute and monitor purposeful actions in the environment (Meyer et al., 2014). Generally speaking, this strategic network handles how we plan or perform different tasks. However, only when students are aware of why they learn (affective network) and what they have to learn (recognition network) is the strategic network (How to Learn?) activated in their brain. This network helps to develop a strategy in the students' minds for how to use the newly learnt information or acquired skills (Novak, 2019). In other words, in becoming strategic and goal-directed learners' foremost students must become a purposeful and motivated, as well as resourceful and knowledgeable learners (Meyer et al., 2014).

In the above-mentioned processes, the role of the teacher is highly important when guiding students to become strategic and goal-directed learners (Meyer et al., 2014) by employing various methods of scaffolding (CAST, 2017). Taking the aforesaid into consideration, we focus on the investigation of which characteristic features of strategic and goal-directed students are revealed in the Lithuanian context and how a teacher-organised learning process, based on the UDL framework, helps students develop their strategic and goal-directed learning skills.

8.2 Methodological Underpinnings of Collaborative Action Research

This chapter draws on the results of a larger study (see Chap. 3). The analysis builds on collaborative action research that was carried out in one school located in Vilnius. The data on which this chapter is based were collected from multiple resources: observations, interviews, reflections and surveys. The study was implemented and data were collected during the 2018/2019 and 2019/2020 academic years. During the first cycle, we collected research data about the learning barriers faced by students who were becoming strategic and goal-directed learners. During the second and third cycles, we collected research data on the development of strategic and goal-directed students by applying the UDL framework and how this process was affected and influenced by teacher-designed learning and teaching settings.

An adapted observation tool by Johnson-Harris (2014) was applied for the observation of the educational process, which allowed for the identification of the level of teacher-designed classroom settings: not UDL, towards UDL and comprehensive UDL (see Table 8.1).

Novak's (2019) UDL Student Feedback Survey tool was used to obtain student feedback. The latter tool was used because it is directly linked to UDL checkpoints (CAST, 2018) and can be used with the UDL Progression Rubric (Novak & Rodriguez, 2018). Therefore, student feedback was directly related to and complemented by the instrument for monitoring teacher-designed settings (especially as we were able to identify student and teacher progress during the observation).

Table 8.1 Observation tool

Level of UDL	Indicators
	Interaction with information in multiple ways
Towards UDL	Multiple options for learning activities through physical actions; multiple tools for learning activities
Comprehensive UDL	Learning experiences alignment with students' learning profile; engagement in learning activities in students own creative and innovative way
	Expression of information in multiple ways
Towards UDL	Formative assessment; multiple options for performance and assessment activities; availability of multiple tools for performance and assessment activities
Comprehensive UDL	Assignments and assessments alignment with students' learning profile; engagement in assignments and assessment activities in students own creative and innovative way
	Executive functioning
Towards UDL	Time and workplace management; attention skills employment
Comprehensive UDL	Personal learning goals setting; personal learning goals accomplishment; feedback and assessment of learning outcomes and performance; support in organizing materials, resources, and tools for personal learning goals accomplishment

Interviews with the students were based on the UDL guidelines, which focus on the development of strategic and goal-directed skills. Interviews with the students allowed for a more accurate interpretation of the observation data during the students' process of becoming strategic and goal directed. The interviews with the teachers largely focused on their experience while developing expert learners, their growth as expert teachers able to create favourable settings for students to develop their expertise, as well as the opportunities and challenges that they faced while organising the educational process based on the UDL strategy while developing strategic and goal-directed students.

The research was conducted at one Lithuanian secondary school that provides primary (grades 1–4) and lower secondary (grades 5–8) education programmes. The school has 1176 students. The study included sixth- and seventh-grade students (27 students: 15 boys and 12 girls; two students with SEN; 12 years old) and two female teachers. There were two SEN students with hearing impairment (cochlear apparatus) and specific learning (reading/writing) disorders. Three students had experienced physical, social and/or psychological trauma. There were several students of Slavic origin in the class. Five students were classified as gifted, and four were less motivated to learn.

The research context underlines that the teachers were introduced to the UDL strategy for the first time at the beginning of the research (cycle one), and they applied it throughout the entire period of the research (cycles two and three). This current chapter presents a generalised overview of the second and third cycles of the collaborative action research; the former was performed in the real settings of the classroom, whereas the latter was organised under COVID-19 pandemic conditions (i.e. the observation of distance learning).

8.3   How Do Expectations Become Reality?

The main point of this chapter is to disclose how students become strategic and goal-directed learners in teacher-created learning settings. Moreover, it focuses on how teachers organise and scaffold students' learning while becoming strategic and goal-directed learners. It is important to note that the following learning barriers were identified in cycle one of the action research: unawareness of different strategies that foster one's learning process; avoidance of challenges and innovations; inability to recognise one's learning; inability to reflect on one's learning and progress; unawareness of self-assessment strategies; and anxiety about public speaking/presentation.

According to the UDL strategy, only by identifying barriers can the teacher scaffold different techniques for assisting a student in his/her learning process (CAST, 2018). Within the UDL framework, the underlying principle of becoming strategic and goal-directed learners is associated with the provision of multiple means of action and expression (CAST, 2018). Under this principle, students develop their strategic expertise in executive functions such as goal setting, monitoring their

progress and achievements, developing and implementing learning strategies for the attainment of learning goals as well as handling information and resources (CAST, 2018; Meyer et al., 2014). Apart from this, a strategic and goal-directed learner should be provided with options for expression and communication that embrace a variety of media and tools that foster construction and composition as well as build fluency via the support of their practice and performance. Finally, students are supposed to have access to various forms of media and tools that facilitate the attainment of learning goals. Subsequently, potential theory- and practice-based assumptions are provided that follow the UDL framework (Meyer et al., 2014): 1) physical action (a student's interaction with information in multiple ways); 2) expression and communication (a student's expression of knowledge/mastery of information in multiple ways); and 3) executive functions (executive functioning in the learning process).

Assumption 1: Provide Options for Physical Action and Navigation Through Educational Settings Students differ greatly in their motor capacities and physical movement, so the teacher should design settings where students can move freely, change their body position, space in the room or outside it and gain access to different assistive technologies (CAST, 2018). Being exposed to a variety of choices in terms of physical actions and multiple technologies and tools, the student is provided with an opportunity to choose, which leads to their responsibility for and self-regulation of their actions. In this way, the teacher creates settings for students to become expert learners within the dimensions of action and expression.

In our case study, the learning experiences and activities were largely limited to teacher-directed assignments. It is noteworthy that the students were provided with sufficient room for navigation, both inside and outside the classroom. The students were provided with various alternatives for selecting the place for task completion. Among the most frequent choices offered by the teachers were different places in the classroom: staying at the desk, working at the back of the classroom, standing by the windowsill, working at the board or smartboard or working in the hall. For some assignments, the teachers rearranged the desks, making the students sit 'at a round table', etc. Seeking to implement the UDL strategy and involve all students in the learning process, the teachers searched for a variety of possibilities to utilise the existing technologies and school/classroom spaces, where the students could study at their own pace and preference.

One of the most conspicuous examples was a Lithuanian language and literature lesson:

> *Lithuanian language and literature lesson (the last lesson of the day). The students cannot concentrate and keep chatting and moving around. Teacher Goda asks the students to create a grammar chant, supported with physical movements, to express their knowledge of the Lithuanian participle. As an alternative to this action chant, the teacher offers the students to use their smartphones and do some online quizzes related to the topic of the lesson – the participle. Out of 24 present students, nine students decided to take the second option: 4 students leave the classroom and work on their smartphones in the hall, whereas five students go to the back of the classroom to perform the online assignment. However, hearing their peers perform the chant, they change their minds and join the 'chanting' group.*

Finally, all the students are actively involved in the activity and experience of learning through movement. (Field notes, 2019)

It is noteworthy that despite having selected one of the options offered by the teacher, the students could change their physical behaviour according to their preferences. Therefore, it can be maintained that the teachers offered a sufficient number of learning modes to customise the learning experience and activity through motion, whereas the students took advantage of the opportunity to try multiple learning modes, thus choosing those that were most compliant with their learning needs and capabilities. On the other hand, students' individual needs and capacities were not always taken into consideration, thus leaving space for barriers that hindered the successful completion of learning activities.

For instance:

In an English lesson, Maikas [who has learning difficulties in English lessons – the researchers' note] does not often understand what the teacher is saying. Maikas is from a Russian-speaking family. In most cases, the teacher tells Maikas in Lithuanian what to do. For example, Teacher Alma tells Maikas in English, 'Please, close the book' while completing the assignment. But Maikas does not understand that. A desk friend picks up and closes Maikas' textbook. (Field notes, 2019)

In a lesson on the Lithuanian language and literature, Timotiejus [a student with SEN – the researchers' note] having a cochlear implant has a number of difficulties expressing himself orally. In verb repetition assignments, Teacher Goda generally suggests opening the notebooks and picking up the handouts given in previous lessons and reading them aloud. Whoever did not attend the lesson, the teacher gives the handouts separately to them. (Field notes, 2019)

Both these observed episodes indicated that students needed assistance with assignment completion. In the first case, the student who needed assistance received it from his peer, whereas in the latter case, the teacher assisted the student. However, it emerged in the study that the same accompanying measures were given to all students, regardless of their learning needs and barriers.

It is noteworthy that during cycle two of the action research, the teachers provided the students with sufficient room for navigation, both inside and outside the classroom. Regarding the place for task completion, the students were offered various alternatives. Among the most popular choices were different places in the classroom: staying at the desk, working at the back of the classroom, standing by the windowsill, working at the board or smartboard or working in the hall. For some assignments, the teachers rearranged the desks, making the students sit 'at a round table', etc. Different learning spaces and learning-through-motion opportunities offered by the teachers empowered the students to exploit the physical settings according to their educational needs and capacities, which ensured a more efficient inclusion of all students in the learning process.

The use of different tools and assistive technologies (e.g. dictionaries, reference books, spelling checkers, iPads, smartphones, etc.) can help eliminate barriers to demonstrating learning (Ralabate, 2016). In our case study, it can be stated that the teachers applied elements of UDL in their practice, which enabled students to develop their ability to choose the right technologies and tools for expressing their

knowledge. The teachers, in addition to course books and workbooks, usually used tools such as multimedia, interactive whiteboards and smartphones in the classroom. Occasionally, the students had an opportunity to complete assignments on the board and smartboard. Among the less frequently used tools were flipcharts, which were mainly used during English lessons. The teachers also employed realia, such as a bag, candies, caps, etc., to make the learning process more active and engaging for the students. For example, students were often given the choice of completing assignments with the help of multimedia or a textbook. Occasionally, the teachers instructed them to use certain tools (e.g. smartphones) to complete the task, yet some students refused to use them.

> *In the English lesson (topic: Healthy and Unhealthy Food), in the task of reinforcing new information, students are given the task of creating a healthy food recipe (including products that are qualified as healthy products). The students are instructed to use their phones in group work. Maikas [who has learning difficulties in the English lesson – the researchers' note] does not use the phone a single time while completing the assignment. Other members of the group use phones and Maikas is actively engaged in a joint discussion with classmates.* (Field notes, 2019)

The teacher, if observing, did not give the student a remark and did not require the use of the smartphone, thus leaving space for the student to make his or her own decision. In other words, using a phone was not the purpose of the lesson but was merely a means to attain the goal. This left the student free to decide whether additional means were required to complete the task. This episode also suggests that the student was able to better memorise and consolidate information provided in the lesson when discussing it with others rather than individually using technologies. This led us to the assumption that the teacher-designed learning setting was compliant with his individual needs and learning preferences.

During cycle two of this study, it appeared that having an opportunity to choose increased the students' self-confidence and courage to demonstrate his or her learning. Consequently, of the 12 lessons observed during this research, the students started to willingly raise their hands and shout, 'I can'*!* [To present the assignment – the researchers' notes] while performing different tasks in class, thus demonstrating their interest and involvement in the learning process.

> *In the Lithuanian language and literature lesson, Teacher Goda sets a verb repetition task allowing students to choose how to do it – using the phone at the back of the classroom or in the hallway or repeating it with the teacher. At the beginning of the assignment, more than half of the class choose smartphones, but at the same time watch the teacher repeating the verb using kinesthetics with the rest of the students. Observing the teacher, they abandon their phones and return to the desks for repetition led by the teacher.* (Field notes, 2020)

This observation episode highlights that enabling the students to choose how to complete the task developed their ability to choose the method that best suits them. The students individually chose how they would perform the task and what tools and technologies they would employ to complete it without consulting the teacher. Also, students were allowed to change their choices. The teacher-created settings that assured the students' free choice of navigating through the assistive tools and technologies allowed them to develop strategies for handling the learning materials

most conveniently; this was a significant step in their development into strategic and goal-directed learners.

> *In the Lithuanian language and literature lesson, Teacher Alma offers a choice to complete the information consolidation task either on page X in the workbook or in the course book. Šarūnė [a moderate student – the researchers' note] initially decides to do the assignment from the textbook. When being asked by her classmates what to do, she repeats and explains the task. However, after a while, she changes her mind and starts doing the task from the workbook. When checking the task, she adds to the task she has completed.* (Field notes, 2020)

In this analysed episode, the student demonstrated how she could change her own choices, finding the most appropriate way to consolidate the material. Following the UDL strategy, the teachers attempted to provide several options for students to employ assistive tools and technologies for assignment completion, which benefited the students in selecting alternative sources for assignment completion, consolidation of the learnt material and demonstration of what they had learnt.

It is worth mentioning that, in choosing various assistive tools and technologies, the students demonstrated their creativity and originality by completing assignments. For instance, during the Lithuanian language and literature lesson, some students brought realia to the classroom, such as a stone or special clothing and jewellery, which they used to perform Lithuanian national songs.

However, devising a lesson plan that would encourage the students to consolidate their knowledge by doing more than a few different tasks simultaneously remained a challenge for the teachers. Meanwhile, the UDL strategy provided choices involving not only a variety of forms but also a variety of task content, thus ensuring equal opportunities for all the students to get involved in the learning process and according to their individual learning needs, abilities and personal goals. Being able to respond to the assigned tasks and present them in the classroom, employing various physical actions that are authentic and compliant with the learning situation and being ready to use and experiment with various tools and learning technologies in the learning environment are the characteristic features of a strategic and goal-directed learner.

The COVID-19 pandemic posed unprecedented challenges for the implementation of the UDL strategy in the educational process. Both students and teachers confronted the need to adapt to online teaching and learning. The implementation of the UDL strategy generally continued through the use of digital tools and resources, whereas the teachers and the students were required to solve educational problems and implement new approaches to inclusive education.

At the beginning of cycle three of the action research, the extreme conditions of the COVID-19-forced school lockdown, due to having to use a variety of assistive tools and technologies, seemed to have created additional barriers to the expression of the students' learning.

> During the Lithuanian language and literature lesson, Teacher Goda warns Jonas to switch on the camera and microphone. Jonas turns on the microphone, yet not the camera.
>
> Jonas: *I don't have one on my computer.*

Goda: *So you have to inform your class teacher, so that she can inform all the teachers that you will not have a camera temporarily. And the school can offer you help – it can lend you a camera, but your parents have to contact the class teacher and explain the problem. Have they done that?*

Jonas*: No.*

Goda: *So you have to do it, since you need a camera. Will you do it today?*

Jonas: *I will have my camera next time.* (Observation, 2020)

This observation demonstrates that the students experienced challenges while using technology during the lessons. They seemed to be unprepared to abruptly adapt to the new situation and lacked autonomy in solving technological-related issues. Although the school provided the necessary equipment for the students to use at home, it was obvious that the students (and their parents) were not encouraged enough to take the opportunity, thus leaving space for interrupting the educational process.

Meanwhile, the students did not put enough effort into becoming involved in the learning process, which created extra challenges for the teachers in involving all students.

Teacher Alma: *'Vaidotas, can you switch on your microphone?' A few minutes pass, Vaidotas does not switch on his microphone. 'Vaidotas, could you switch on your microphone, please? We all have to participate in the discussion'. Vaidotas turns on his microphone.* (Observation, 2020)

This observation reveals that the students were not willing or ready to use their cameras and microphones during the lessons, thus leading the teachers to waste lesson time making remarks to individual students. Hence, it can be claimed that the use of a variety of tools and assistive technologies throughout the pandemic remained a serious obstacle to the students' active learning process.

Regardless of students' reluctance to properly employ assistive technologies in their learning process, the teachers provided the students with a wide range of creative assignments through which they could demonstrate their skills as strategic and goal-directed learners: creating posters, filming, audio and video recording, making PowerPoint presentations, using Liveworksheets, Padlets, etc. The teachers noted the benefits of using various assistive technologies, which allowed them to more effectively engage students, including those with SEN, in the learning process.

Teacher Goda: *Well, I believe that presenting the interactive content of the lesson in a responsible way is fundamental to the success of the lesson. The content should be good and presented in multiple ways; otherwise, it won't work. In other words, you are responsible for the quality and diversity of the curriculum, its presentation in multiple ways so that it becomes most beneficial to every student.* (Interview with the teachers, 2021)

It is noteworthy that, while implementing the UDL strategy in their teaching process, the teachers tried to present and navigate the teaching content by employing a variety of teaching tools and technologies. This was a great challenge for the teacher, as it required her to align learning experiences with a student's strengths, interests and preferences as well as to know the student and the learning profile of

the class as a whole. Thus, the teachers should design activities so that the learning outcomes are authentic, communicate to real audiences and reflect on the purpose that is clear to the participants (CAST, 2018).

The research data demonstrate that the teachers developed appropriate learning settings that offered the students multiple ways to respond to and navigate the curriculum materials, while completing tasks by employing various motor actions, tools and assistive technologies, thus creating a positive environment for their development as goal-directed and strategic learners. The teachers not only helped the students to develop into being strategic and goal-directed experts in their learning; they progressed as expert teachers in the process of engaging all students in the educational process. The UDL strategy was successfully implemented by providing multiple options for physical action. This is while empowering the students to choose the tools, technologies and actions that best complied with their educational needs, interests and preferences. The teachers created settings in which the students had an opportunity to personalise their choices and express their knowledge and skills through multiple assistive tools and technologies.

Assumption 2: Provide Options for Expression and Communication Different students apply different kinds of communication while relying on their personal learning goals, learning strategies, abilities, educational needs, interests and preferences. Therefore, according to the UDL framework, it is critical to develop educational settings in which students are provided alternative modes of expression and communication (CAST, 2018; Meyer et al., 2014). This will allow students to employ a wide range of media that are meaningful for communication and literacy in the multimedia culture. Besides, students vary in both their capacity to express themselves through traditional speaking and writing assignments and their familiarity with and ability to use various media in the process of learning. Therefore, the teachers should be ready to offer multiple media and tools for completing and presenting the acquired knowledge and skills, provide alternatives for different modes of a student's individual and collaborative work and help them build fluencies by using timely, consistent, flexible and personalised scaffolding and performance feedback.

During cycle two of the action research, the analysis of the interviews with the teachers revealed that the students were not inclined to look for different information sources but rather limited themselves to using Google or Wikipedia. Oral delivery usually takes the form of an oral presentation. This means that students have not mastered multiple ways to demonstrate their learning outcomes. Therefore, teachers need to encourage students to look creatively at how they can communicate the information or skills they have acquired through more diverse media, such as drawing, film design, music compositions, model making, storyboards and other mediums. Hence, the issue of expression and communication is another particularly important dimension of UDL. During the observations, we identified that only certain elements of the said UDL dimension were applied to educational practice.

With inclusive education, it is paramount to create educational settings where students are exposed to alternative media that can be used for expression and

communication and is compliant with their individual educational needs, abilities and interests. The analysis of the research data collected during cycle two of the action research signified that the teachers provided the students with a sufficient choice of media and tools for the completion and presentation of their performance. Observations of the educational process helped to distinguish two tendencies of teachers' presenting a variety of media and tools. While working in real classroom settings, the teachers were inclined to restrict the students to more traditional ways of expression and communication, such as completing written assignments in textbooks and/or workbooks, writing on the board or completing written tasks on the smartboard or making oral presentations to the class.

For example, in the Lithuanian language and literature lesson:

Teacher Goda allows different ways of completing the task either in the notebook or on the smartboard, as well as employs different ways of evaluating the completion of the task. The students who have decided to complete the task on the smartboard can immediately find out the correct answer by opening it on the board. Those who have chosen to do the task in the notebook do not all have the opportunity to speak when checking the assignment. Some do it voluntarily, others simply follow their notes. (Field notes, 2019)

This observation episode shows that apart from conventional methods of assignment completion, the teachers also offered an alternative medium (a smartboard) for students to express their acquired knowledge and skills. Such a choice of alternatives can help reduce media-specific barriers to expression and communication for students with varying educational needs and increase the opportunity for all students to develop a wide range of skills that are essential for selecting the optimal media and tools for expressing and communicating the learning content.

Implementing the UDL strategy, the teachers offered multiple media alternatives and tools for the students to demonstrate their knowledge and skills, such as singing folk songs, making poster presentations in small groups and composing lists of various items (e.g. a list of healthy food) and the likes. Moreover, the teachers provided a few opportunities for students to demonstrate their knowledge and skills through participation in games and quizzes. Occasionally, the students were encouraged to search the internet for information that was necessary for task completion. However, while analysing the research data collected during cycle two of the action research, it appeared that the teachers did not always offer multiple options for the students to choose how to demonstrate their classroom learning. For example, not all the students were involved in games or quizzes (e.g. Kahoot): in one of the English lessons, Timotiejus (a SEN student – the researchers' note) was leaning tediously on the desk while some students were playing. (Field notes, 2019).

Another episode illustrates a similar situation in which some students were not engaged in the educational process due to a lack of interest and motivation to participate in expressing their knowledge and skills.

In the Lithuanian language and literature lesson, Teacher Goda applies the 'bag' method [the bag being dropped and the students have to respond quickly using the correct verb form. Tadas [a strong student – the researchers' note] is actively involved in the game and during the interview describes the game as 'things like this are good … Meanwhile,

Timotiejus [a SEN student – the researchers' note], is not playing and is lying on his desk during the activity. (Field notes, 2019)

Later in his interview, Timotiejus stated that he preferred various schemes and projects *rather than* games (Kahoot, the 'bag', etc.) and creative assignments (composing a song, creating a storey, etc.), yet the above episodes reveal that he had to perform the same assignments in the classroom like everyone else.

Meanwhile, during the interview, Sofija pointed out that mechanical tasks, such as gap-filling, matching, word-building and similar assignments, were too easy and boring for her, and she preferred more complicated and challenging creative assignments; yet, she was offered the same tasks and options as the remaining students.

Sofija: *There is no possibility to do any projects or anything else right now. And if [talks about projects – the researchers' note] we have to do a project, it is set for the class as a whole.* (Interview with the student, 2019)

During the interviews, the students also expressed the view that they were given little opportunity to demonstrate what they had learnt in each lesson: *'Well, you can… a little…'* (Sofija, 2019); *'Well maybe … when you are asked something'* (Šarūnė, 2019).

The presented examples highlight that some students encountered barriers to their learning in terms of the expression and communication of the acquired knowledge and skills; thus, their process of developing into expert learners was inhibited by the lack of sufficient exposure to a choice of multiple media and tools for completing and presenting their knowledge and skills. An ability to purposefully select appropriate media and tools that conform to the student's capabilities, interests and needs, which is considered one of the characteristic features of a strategic and goal-directed learner, seemed to be a significant challenge for the teachers when implementing the UDL strategy.

Strategic and goal-directed students are characterised by their ability to work both individually and in collaboration with others. Interaction with others helps students acquire and apply knowledge and skills in various contexts. Provided it is based on equal partnership, collaborative work encourages students not only to set personal learning goals and choose to learn strategies but also to share and align them with collaborative group members, thus ensuring the inclusion of all students in the educational process.

During this action research (cycle two), it was determined that the teachers provided multiple options for the students to organise their learning: individually, in pairs or cooperative groups. Different group formations were employed; collaborative pairs and groups were formed by the teachers or students. Depending on the type of assignment, the teachers occasionally formed pairs, usually putting a better academically performing student with an academically slower one. The teachers used different ways of group and/or pair work; for instance, the students were instructed by the teacher to form pairs, allowed to freely choose who to perform the task with, choose 'a 12 o'clock friend', play the fortune wheel and others.

During this research work's observations, it was noted that students were allowed to choose how to perform tasks – individually, in pairs or groups – and demonstrate

their knowledge. In the case study, the majority of students chose to complete assignments in pairs and/or groups. Some of the students observed that if they were given the choice of whom to do the tasks with, they would choose different groups for a variety of reasons.

Sofija: … *the funniest, the least work, the easiest … faster time.*

Šarūnė: … *still more interesting … can better clarify the topic.* (Interview with students, 2019).

The above examples demonstrate that, for some students, information was better consolidated and easier to present to the teacher when tasks involved peer work. Interaction with others helped students acquire and apply knowledge and skills in various contexts. For example, in the English lesson (topic: healthy and unhealthy food):

Teacher Alma allows students to choose to complete the task individually or in pairs. Maikas [who has learning difficulties in an English lesson – the researchers' note] chooses to complete the task with the desk friend Tadas [during the interview, he identified the English subject as the best-performing subject for him at school – the researchers' note]. At the end of the assignment, Maikas, who has previously been inactive in presenting the completed assignments, offers himself to present this one. (Field notes, 2019)

As seen from the above example, cooperative learning encourages positive interdependence when students can maximise their own and others' attainment of goals and performance. Moreover, cooperative learning allows students to understand that the better performance of an individual student leads to better group performance. Working in groups and pairs ensures the inclusion of all students in the learning process according to their individual needs and abilities; this also helps to develop the social and collaborative skills essential for an expert learner.

It is also important to note that the teachers supported the students in making pairs and joined those who were left without. For example, in the Lithuanian language and literature lesson:

Teacher Goda: *Now, to do this task you have to find the 12 o'clock friend. Go and choose the 12 o'clock friend. Saulius, have you found one?*

Saulius: *No.*

Teacher Goda: *Now, who hasn't got the 12 o'clock friend yet? Liutauras? Saulius, join Liutauras – he hasn't got the 12 o'clock friend. Maikas, why are you alone? Is anyone else free? No? OK, I will be your friend.* (Observation, 2019)

This episode reveals the teacher's genuine involvement in the assignments. Following the principles of collaborative learning, the teacher became part of the team and played an active role in the communicative discourse with the students.

This research revealed that the students were more likely to choose to work in collaborative groups or pairs, although some students (e.g. Jonas) preferred to individually complete the assignments. The data obtained from the student interviews indicated that they preferred choosing their learning partners rather than being instructed by the teacher.

Tadas: *… in those interactive things [he talks about online tools like Kahoot – the researchers' note]. Sometimes the time is set for their completion.*

Šarūnė: *… when we collect the pluses … for active participation.* (Interviews with the students, 2019)

As the student interviews show, the students liked different options for expressing their learning in groups, which involved their active participation in the learning process. This allowed all members of the group/pair to work through peer teaching. Peer teaching is one of the techniques employed in the process of learning to learn and is a crucial element of the UDL strategy. Thus, by forming pairs and groups based on peer teaching or collaboration, the teachers created educational settings that were beneficial to the students' transformation into becoming expert learners, able to set common learning goals and choose strategies that conformed to the needs and abilities of the group/pair members. Following the UDL framework, an educator should engage the student's strategic networks by scaffolding and offering them flexibility in how they demonstrate their learning. Hence, scaffolding and feedback are of crucial importance in the educational process when seeking the inclusion of all students. One of the characteristic features of a strategic and goal-directed learner is his or her ability to solve problems independently and through networking with peers. In this case, scaffolding appears to be an essential strategy that was used by the teacher when creating educational settings in which students can mature into interactive, goal-directed, strategic and solution-oriented learners.

The collected data revealed that the teachers consistently and regularly employed scaffolding and feedback strategies in the education process. The most frequently applied scaffolding strategies were: using visuals, reading, connection to background knowledge and student experience, modelling, graphic organisers, intentional group or pair work and use of the mother tongue (in English lessons). Analysis of the student interviews revealed that the students found employing visuals, graphic organisers and intentional group/pair work as most beneficial to their learning:

Sofija: *There are many questions to answer, and sometimes the teacher offers how to do some work on that topic, or how … for example, prepare slides…* (Interview with the student, 2019)

Scaffolding was reinforced by consistent and regular feedback. It is noteworthy that the teachers provided both instructional and differentiated feedback. The analysis of the student interviews and survey revealed that the students received efficient instructional feedback, which was provided by the teachers in various ways: explaining the tasks eliciting their most challenging parts, answering the students' questions, providing extra explanations by walking around the classroom and checking the students' progress, synthesising and analysing the most conspicuous errors in the students' performance and task completion. Also, the teachers provided differentiated feedback that focused on the specific challenges faced by individual students.

In the Lithuanian language and literature lesson, Teacher Goda reminds the students that some of them (the ones who had problems with understanding the lesson content – Kotryna and Timotiejus) will receive extra materials and explanations by email. (Field notes, 2020)

This episode demonstrates that the teacher was concerned about providing appropriate scaffolding for students with SEN, thus ensuring the successful inclusion of all students in the learning process. By providing scaffolding and feedback provisions, the teachers created a favourable educational setting for the students to develop into autonomous and self-contained learners who assume responsibility for their learning and recognise their strengths and weaknesses.

Considering the COVID-19 pandemic (cycle three of the action research), the range of alternative media and tools offered by the teachers for expression and communication increased considerably. The students were encouraged to create stories and fairy tales, make PowerPoint presentations, make video and audio recordings of their performance, develop individual projects and posters, employ Padlets and Liveworksheets, etc. The students could also demonstrate their learning and performance by answering questions orally or writing the answers in the virtual classroom's chat room. It should be noted that by the end of the action research, the teachers had already succeeded in offering the students several options regarding the use of tools and media to present their performance, which shows their considerable growth as expert teachers.

> *At the beginning of the English lesson (topic: 'Fairy tales 2'), Teacher Alma reminds the students of the three options of how they could present their task of looking through the selected fairy tale and composing a different ending. The options included filming the life presentation of the fairy tale; writing it on Google Drive, or sending it by email. The majority of the students chose to upload their fairy tales on Google Drive.* (Field notes, 2020)

It is obvious that during the distance learning period, the students were offered a greater variety of media for presenting their learning results. However, the students did not demonstrate their willingness or readiness to choose the options that they were less used to and chose the ones to which they were most familiar. Although the teachers tried to widen the choice of various media and tools for the students to complete and present their learning, thus minimising the learning barrier, this study proved that the students were not ready enough to choose the options of which they were less familiar.

It also appeared that extreme conditions (e.g. the COVID-19 pandemic) somewhat restricted the frequency of employing collaborative learning in the virtual classroom. However, the research data demonstrated that this method of learning was organised more effectively.

> *Teacher Goda presents the new topic 'Padalyvis' [adverbial participle – the researcher's note]. The teacher assigns a task for the students to demonstrate their understanding: one student tells a participle and chooses another student, who has to change it into the adverbial participle. All the children are actively involved in the task completion.* (Field notes, 2020)

The playful character of the presented task allowed the students to become more actively involved in its completion and increased their motivation for learning and participation in the lesson. It can be concluded that the opportunity for the students to choose their partners helped to create an atmosphere that bolstered their self-confidence and eliminated their fear of making errors.

One of the characteristic features of a strategic and goal-directed learner is his or her ability to solve problems independently and network with peers. In this case, scaffolding appears to be an essential strategy that was used by the teacher when creating educational settings in which students can mature into interactive, goal-directed, strategic and solution-oriented learners. In this respect, the teachers also matured as expert teachers by foreseeing and considering the barriers to learning that their students might experience and discussing their difficulties with them.

> *In an English lesson (Topic: The Past Perfect), the students continuously make mistakes when performing the assignment. Teacher Alma reminds the students of the platform where they can revise the formation and use of the analysed tense form. She gives time for the students to log in and goes through the provided materials together, eliciting from the students the most important aspects of the analysed topic.* (Field notes, 2020)

This situation suggests that the teacher provided the students with a scaffold (platform), which helped them back up their knowledge of the topic and thus created a favourable setting for the students to assume responsibility for their learning and recognise their strengths and weaknesses.

Apart from giving students support and feedback, the teachers also encouraged their peers to give constructive feedback to their classmates.

> *In the online English lesson (topic: 'Fairy tales 2'), Teacher Alma introduces the task – to create a different end of a well-known fairy tale and presents the criteria that the students have to apply in providing feedback to their peers: number of words (150 words), the level of unexpectedness and lexical-grammatical accuracy. Maikas reads his story with great difficulty. The teacher assists him a lot with pronouncing the words. Afterwards, the students are encouraged to provide their feedback. Justė just gives a mark, which is 3-4, without much explanation. She does not make any reference to the assessment criteria. The teacher emphasises that it is only the student's personal opinion. Other students present their stories and receive the same feedback. Throughout the whole lesson, the teacher asks for comments, yet the students do not know what to say.* (Field notes, 2020)

This episode demonstrates that the teachers sought to involve the students not only in assignment completion but also in its evaluation and feedback. For this purpose, the teacher developed a system of criteria that the students could use when formulating their feedback. The students were not yet used to providing evaluations and feedback to their peers. Yet, the new practice of getting the students involved in all stages of the process can serve as a highly positive example of both teachers and students maturing into expert learners. By enabling the students to evaluate their classmates by following assessment criteria, the teachers develop the students' self-esteem and self-regulation skills as well as encourage them to take responsibility for their learning, thereby helping the students to develop the features of a strategic and goal-directed expert learner.

The same idea is emphasised in the teachers' interviews at the end of cycle three of the action research.

> Teacher Alma: *We as teachers always come to the lesson with the goal to teach. Yet, it depends on the students themselves whether they will learn something or not. We cannot learn for them, we can only help, guide and advise them (i.e., scaffold – the researchers' note), but they can only learn themselves. This barrier can be overcome only when the students take the initiative in their hands.* (Interview with the teacher, 2021)

The teachers' understanding of their role in the classroom changed considerably throughout the action research. The teachers had considerably expanded the use of media and tools for the students to accomplish and present their assignments, carefully supported the students in choosing the groups and pairs for collaborative work; they minimised the instructing of students replaced this with scaffolding based on the analysis of student variability and a prediction of the possible challenges that their students could experience during the learning process. This implementation of the UDL framework helped the teachers think about how to remove barriers and provide scaffolding and support to *all* students, thus revealing the process of their growth into becoming expert teachers.

Assumption 3: Provide Options for Executive Functions Based on the UDL framework (Novak, 2019), the provision of options for executive functions means that the assignments should begin with an objective and tips, or a checklist to work on the assignment should be given to students about how to stay organised during the assignment should be provided, and reflection and feedback on their work should be presented before the assignment is completed. The teacher's full support is indispensable during this action and expression process.

According to Ralabate (2016), the first option for the successful implementation of executive functions is setting learning goals, which should be flexible enough to provide all students with an opportunity to attain them, as well as serve as motivators for students, providing them with a clear understanding of the target knowledge and skills that are addressed in the lesson. Clear and flexible lesson goals help students set personal learning goals more easily to become successful goal-directed and strategic learners.

Based on the observation data from cycle two of the action research, we identified that the teachers helped students set their learning goals, choose ways to achieve those goals, etc.; however, this observation was based on isolated and unsystematic evidence. At the beginning of the lessons, the teachers introduced the lesson goals, yet they did not always encourage the students to relate to their personal goals. Moreover, they did not restate their goals at the end of the lesson and did not emphasise or discuss their attainment.

In their interviews, the teachers admitted that:

Teacher Alma: *It is very hard to encourage the students to set personal goals, because our system is absolutely teacher-centred, the students expect to be told what to do, how to do by the teacher. In general, it is uncommon for students to set personal goals.* (Interview with the teacher, 2019)

The student's interviews confirmed this fact.

Researcher: *After the teacher introduced the goals of the lesson, did you think of your own goal of what you wanted to learn in the lesson?*

Jonas: *Yes.*

Researcher: *What was that?*

Jonas: *I don't know. To learn something.* (Interview with the student, 2019)

These episodes demonstrate that, in the Lithuanian context, the students are not always used to setting personal goals and are frequently unaware of what these goals generally are. Although the teachers announced the goal at the beginning of the lesson and encouraged the students to formulate personal learning goals, they did not always come back to them at the end of the lesson. Moreover, some personal goals set by individual students were sometimes imposed on other students and became lesson goals for all.

> *Having announced the lesson goal in an English lesson (topic: Healthy eating), teacher Alma encourages the students to set their personal goals. Only two students are able to communicate their personal learning goals. Tadas sets the goal to learn more about healthy eating, whereas Sofija sets another goal: 'To learn a few new words'. The teacher encourages the rest of the class to think of the exact number of new words to be learnt by every student. The teacher spends about five minutes asking the majority of students how many new words they would like to learn.* (Field notes, 2019)

For UDL, it is important that learners develop the skill of effective goal setting. During the interviews, the students stated that they were reluctant to set long-term (in this case, for the semester) learning goals:

> Sofija: *Well, just as well as learning.*

> Tadas: *I wanted to improve in the sciences where I did not do well last year.* (Interview with the student, 2019)

As far as the goals for a specific lesson were concerned, the students claimed the following:

> Tadas: *I don't really think about it … [a pause – the researchers' note] … well… learn the topic the teacher tells or improve what I have already learnt.*

> Sofija: *Well, not always … It depends on what part of the course is taught. For example, in Lithuanian it is not always, sometimes. I never think about Maths at all.* (Interview with the student, 2019)

These episodes led to the assumption that the students were not fully aware of the importance of setting personal learning goals and did not attach any significance to them. Despite the teachers' efforts and encouragement for the students to set their learning goals, the students did not take this seriously. Developing the students' ability to set up and try to achieve a goal was not facilitated by explaining the purpose of a particular task or how it could relate to the student's individual goal. Although the students started setting personal learning goals and searched for different ways to attain them, which were significant signs of their maturing into goal-directed learners, they did it unsystematically. Hence, during cycle two of the action research, the domain of setting personal goals remained a sensitive issue in the context of students' transformation into becoming strategic and goal-directed learners.

Once students set their personal learning goals, they have to plan their strategies of how to attain these goals. A goal-directed and strategic learner can devise a strategic plan that will lead them to reach a goal, as well as reflect on the time and resources needed. Therefore, an appropriate learning setting should be offered for

students to plan and attain individual learning goals. Following the UDL framework, learning strategies are how students organise their learning by using a particular set of skills to accomplish tasks more effectively, thus implementing the set learning goals. In this case, the focus was not on the curriculum's content but rather on the student's ability to learn. Developing the student's ability of 'learning to learn' by employing a variety of strategies creates preconditions for them to strengthen their executive functions leading to the development into strategic learners.

It is noteworthy that the collected action research data (cycle two) proved that the students' abilities to use a variety of learning strategies were stimulated during the lessons, yet this was not done regularly. A more common case was that the teacher provided a detailed plan for a student to follow rather than encouraging their full engagement in planning their learning. Nevertheless, the research evidence highlights that the students managed to choose and implement their learning strategies when completing creative homework assignments, such as making presentations, projects and composing essays.

> *In the English lesson (topic: healthy and unhealthy food), Teacher Alma assigns homework: to find and make the top ten healthy and unhealthy food list. Any source may be used to complete the task, whereas its presentation will be performed upon the student's choice.* (Field notes, 2019)

This episode demonstrates that the selection of a learning strategy is often associated with the ability to select appropriate tools for its implementation. Therefore, the ability to choose appropriate tools that are compliant with the strategy of demonstrating one's performance and learning achievements is a characteristic feature of a strategic and goal-directed learner who seeks to become an expert learner.

According to the UDL framework, another executive function involves an ability to reflect on one's learning activities and learning results. The research data demonstrate that the students had an opportunity to develop as reflective learners during the action research period. Reflecting on what they had learnt, the students could identify their newfound knowledge and learning content, their learning needs and how these can be addressed, as well as share the learnt content and awareness with the teacher and peers. During the interviews, the students noted the following:

> Sofija: *When you come home you think you could do more there, do something else…*

> Tadas: *Mmm …. not good. Maybe … when doing homework. But not much.*

> Šarūnė: *Well, I thought maybe I could do something better or learn something more at the weekend, something that I didn't understand …* (Interviews with the students, 2019)

It is noteworthy that the students' reflections are rather superficial and focus more on the learning conditions (e.g. studying more over the weekend, when doing homework) or provide non-defined aspects of reflecting on their learning (e.g. something better; something more; something else; etc.).

The students' ability to reflect was closely related to the assessment strategies employed by the teachers. This study demonstrated that when planning lessons, the teachers carefully considered the students' assessment. While presenting the lesson

goals and procedures, they clearly stated their assignments and assessment criteria. It is noteworthy that the teachers planned and implemented formative assessments in accordance with the learning goals. The interviews with the students demonstrated that they had a clear understanding of the assignments as well as the assessment criteria and procedures.

For example, they claimed that:

Pijus: *I don't always like the tasks, but I always know what and how to do them …; … the teacher always tells us what we have to do and what we will get after completing them;*

… I like the system of pluses – you can always collect extra pluses and get a better mark. (Interview with the student, 2019)

Jonas: *Yes, before the test, we can collect other marks and pluses, sometimes minuses [laughs – researcher's note] and I like it. It is not so scary to write the test then, because you know that you have already got some good marks.* (Interview with the student, 2019)

These episodes demonstrate that the students appreciated the fact that the teachers provided clear assessment criteria, which they found clear and beneficial to their learning. However, it is noteworthy that teachers have hardly ever involved students in assessment planning or developing assessment criteria.

During the implementation of cycle three of the action research (i.e. during the COVID-19 pandemic lockdown), there appears to be some evidence that both teachers and students started considering the setting of personal learning goals as being an important part of the learning process and even managed to link this to the reflection of its attainment.

Teacher Alma: *After the two years of the project, we started emphasising that it is very important for students to set their personal learning goals at the beginning of each lesson, and then reflect if they succeeded. And then we [the teachers – the researchers' note] ask: 'Did you succeed? What helped you to succeed? Why wasn't it successful? What could you do better'?* (Interview with the teachers, 2021).

The teachers encouraged the students not only to set the goal but also to reflect on their attainment. It is important to note that reflection on the attainment of personal learning goals helped the students plan their learning process and select and adapt corresponding strategies to achieve the set goals, whereas the teachers were provided with directions on how to plan the lesson content so that every student could benefit from it and acquire an opportunity to mature into becoming a goal-directed learner.

The findings also demonstrate that by encouraging the students to reflect on their learning and goal setting, the teachers also developed the students' ability to choose or adapt strategies for their learning and performance.

In the online English lesson (topic: Fairy Tales 2), before presenting his fairy tale, Vaidotas explains the ways and strategies he has employed while completing it: 'I have chosen the story about the gingerbread man because he seems the most realistic to me, like a person. The ending is very short, but I put a lot of extra information throughout the story … Yes, it appeared too long and first, but then I read it again and removed what was too long or unnecessary.' (Field notes, 2020)

This demonstrates the student's ability to choose various strategies for task completion, such as choosing a fairy tale compliant with his interest, synthesising the new information with the ready-made text as well as revising and editing the final product, which, according to the UDL framework, is essential for a student to develop into becoming a strategic learner.

The data collected from the teachers' interviews foster the significance of reflecting on goal setting and the choice of appropriate learning strategies.

> Teacher Goda*: The greatest difficulty for them is to plan their learning (set personal lesson goals, and the like); change their learning practice after realising that not all the proposed or selected ways of learning are equally suitable and helpful for learning. And it is so interesting that when we started to use 'Reflectus' programme, they (the students – the researchers' note) started discussing the issues (related to the goal setting and choice of the strategies – the researchers' note) more in class.* (Interview with the teachers, 2021)

This episode reveals that the more students were stimulated to set personal goals and choose compliant strategies for their attainment, the more they realised the benefits. Hence, it is possible to claim that the students acquired more experience with assuming responsibility for their learning as well as with planning their progress and learning outcomes.

Further analysis of the research data revealed that the teachers varied their learning resources and materials and offered a variety of tools for use during the learning process. It is noteworthy that traditional educational means prevailed in the classroom: textbooks, workbooks, handouts, assignments on the board and smartboard, etc. During lessons, the teachers set the same or similar assignments and provided students with the same or similar learning materials. Moreover, it is noteworthy that the most frequently selected tools by the students for presenting their performance and completion of assignments included PowerPoint presentations.

> *In an online Lithuanian language and literature class (COVID-19 epidemic situation; topic: 'Defenders of Freedom'), the majority of the students presented their projects using the PowerPoint tool. A small group of students did not present their projects. 'If you don't want to make a PowerPoint presentation, you can either write a composition or make a poster and send it to me'.* (Observation, 2020)

Although traditional tools, such as textbooks, workbooks, handouts, etc., remain the main tools employed in the lessons, it should be noted that the lockdown stimulated the students to choose more varied tools for task completion and presentation as well as demonstrating learning performance. In English lessons, the students frequently employed the chat room of the virtual classroom to respond to the teacher's questions, as well as to ask questions about the learning materials, content, tasks to be performed, etc. Moreover, they could present the accomplished assignments to the teacher by using Google Drive, email and virtual classroom. In the Lithuanian language and literature classes, the students made PowerPoint presentations, designed posters, wrote compositions and uploaded them to the online classroom platform, etc. Student exposure to a variety of media and tools used for the completion of assignments and demonstrating the performance develops the students' responsibility for their learning and choice, an ability to plan their learning

and performance as well as increases their engagement in motivation for task completion, which are relevant features of an expert learner.

The results of cycle three of the action research reveal that the teachers started employing multiple tools for assessment, thus encouraging the students to execute their learning:

> *In the online Lithuanian language and literature lesson (topic: 'Defenders of Freedom'), Teacher Goda sets clear assessment criteria for the presentation of student projects: the content, its main facts; influence on the listeners (ability to communicate with the audience); and language accuracy. Additional criteria for the listeners to get extra points: employing personal or family experience in defending the national freedom and active questioning of peers after their presentations. Two groups of assessors were formed: optimists, who would evaluate only the positive aspects of peer presentations (4–5 students) and pessimists, who are supposed to note the drawbacks and criticise peer work (4–5 students). The students get actively involved in choosing the optimist or pessimist group.* (Field notes, 2020)

This episode demonstrates that the students were encouraged to provide their feedback and assessments of other students' work, yet they were not encouraged enough to substantiate or explain the assessments they gave. Nevertheless, the students were willing to provide their feedback and assessment by being active in responding to the teachers' and peers' questions and expressing their opinion and judgement. It is noteworthy that the students became engaged in providing feedback while in a playful and depersonalised setting (e.g. when a student is given a role to perform, such as being a pessimist or an optimist). Active student engagement in feedback provision and assessment created favourable conditions for them to develop into learners.

The teachers' practiced setting the assessment criteria for assignment completion; this helped the learners evaluate their work and find ways to match their performance to all the assessment criteria, which was positively evaluated by the researchers. However, it should be noted that the teachers did not involve the students in the process of the assessment-criteria design. However, analysis of the research data helped reveal the sensitive and strong sides of the teacher-developed settings in terms of them providing options for the students' executive functions. Establishing learning goals and choosing appropriate strategies for their implementation are considered the domains that necessitate further consideration from the teachers, whereas the domain of providing a relevant and ongoing assessment is considered best-mastered by the teachers.

Summarising the analysis of the observation and interview data, it can be stated that the researchers noted positive development of a goal-directed and strategic learner's features. Students developed their executive abilities to plan the strategies of how to achieve the goal and perform the task, choose appropriate tools and media for task completion and presentation as well as provide feedback for their peers relatively well. Meanwhile, setting purposeful learning goals, choosing the means to achieve these goals and reflecting on one's learning experience can still be considered as areas for further improvement, although the students' development is also notable.

Throughout this action research, notable changes were recognised in the teachers' planning and implementation of the educational process in the classroom. The teachers considerably expanded the employment of media, tools and assistive technologies to facilitate the students' performance in the educational process, broadened their expertise in student scaffolding and feedback provision as well as guided the students in setting personal learning goals and selecting corresponding learning strategies and learning resources and tools. Although some aspects of UDL implementation still need further development (e.g. reflection, etc.), it can be concluded that the teachers also matured as expert teachers, able to ground their teaching processes on fundamental UDL strategies.

8.4   Discussion and Conclusions: Developing a Strategic and Goal-Oriented Student

In this chapter, we sought to represent the summarised research evidence of how, using the UDL framework in the Lithuanian context, we can create a student-oriented education process, specifically, how each student can become a strategic and goal-oriented student regardless of his or her abilities, needs, interests, etc. According to the UDL strategy, a student becomes strategic and goal-directed only if s/he has previously mastered the abilities attributable to a purposeful and motivated, as well as knowledgeable and resourceful, learner. In other words, when students know 'why' and 'what' they are learning, they can choose 'how' to learn.

The answer to the former (why and what) questions is related to the activation of different parts of the brain – affective and recognition networks – during the learning process (Meyer et al., 2014). The activation of these networks is an essential basis for the operation of a strategic network. This strategic network 'guides our behaviours by enabling us to set goals, identify strategies, focus, monitor progress and correct our course of action' (Rose & Strangman, 2007, 383). In other words, according to the UDL framework, this strategic network in the brain reveals the abilities of a strategic and goal-directed student (Meyer et al., 2014).

Following the action research results that were conducted in a Lithuanian school, it can be stated that the students did not fully reveal themselves as goal-directed and strategic participants in the educational process. In the context of applying the UDL approach, the following abilities of a strategic and goal-oriented learner were disclosed: respond to tasks, choose and apply media and aids of different modalities for an activity and demonstrate this activity's results and knowledge. The need for students to improve their ability to plan, apply and reflect, develop strategies for the attainment of learning goals, choose a learning strategy that complies with their learning strengths and self-evaluate the efficiency of the strategies applied for the attainment of goals is still relevant. The analysis revealed that the students still needed scaffolding and support while setting personal learning goals and planning their learning by employing multiple learning strategies.

As mentioned before in the case of our research, goal setting, self-evaluation, learning management and other skills necessitate improvement. As Schunk and Rice (1991) pointed out, for students to be able to self-evaluate their work as well as reflect on and analyse their learning process, a clear learning goal must first be established. The importance of goal setting in the outcomes of the educational process was revealed in the study performed by Dotson (2016). This study revealed that goal setting significantly improved the reading skills of fifth-grade students compared to their reading skills while in the fourth grade. Having a set learning goal ensures the development of students' learning achievements (Dotson, 2016). At the beginning of the learning process, what will be achieved in the educational process is already known, thus enabling the learner to design all learning activities in the classroom.

When searching for the factors that determine learning outcomes, it is important to recall the results of Hattie's (2017) research. The meta-analysis of 80,000 studies demonstrated that the main factors that potentially considerably accelerate students' achievement are teachers' estimates of achievements (effect size: 1.62), collective teacher efficacy (effect size: 1.57) and students' self-reported grades (effect size: 1.33). Self-reported grades are a practice by which students assess the quality of their work or their level of mastery of a given objective. Moreover, having a learning goal as part of purposeful and motivated learning engages the learner to immediately plan and choose a learning strategy that fits his or her learning 'profile'. The choice of a learning strategy underlines how a person thinks and acts while planning, carrying out and evaluating his or her learning activities and outcomes (Schumaker & Deshler, 2006). Having set a learning strategy determines learning success (Rovers et al., 2018) since the students can critically choose the mode of action that corresponds with their capabilities (strengths) during the learning process. The choice of such a strategy creates conditions for a smooth (effective) self-assessment of one's performance, which results in the success of learning. Consequently, effective planning, organisation, operation, reflection and self-assessment of one's learning process are directly related to the learning goals set at the beginning of learning. Thus, the absence of a learning goal at the beginning of learning prevents other abilities from developing effectively. In the case of our research, to achieve a goal-directed student in the Lithuanian context, it is important to ground the educational process in goal setting.

How teachers view their students affects the students' learning (Hattie, 2017). It is important for teachers to understand how their students learn and how their instruction affects not only the process of knowledge acquisition but also the process of developing learning skills through practicing, as well as examining and experiencing the environment. Relying on the strategic network of the student's brain helps teachers support his or her learning environment. Teachers can stimulate students' strategic network by gaining their attention, considering different learning styles, making the learning content meaningful and relevant for students, connecting it to their current knowledge and experiences as well as allowing them to apply it and personalise its meaning. Hence, it is important that teachers create

appropriate settings for learners to plan, organise, initiate, sequence, coordinate and monitor their purposeful actions, thus activating the brain's strategic networks.

The research results show that the ways to develop a strategic and goal-directed learner, which were applied by the teachers, only partially coincide with the principles of the UDL approach, which results in the slow formation of abilities attributed to an expert learner in this area. However, in the case of our study, there was an obvious change in teacher education practice in offering the students alternatives in the educational process, such as physical responses to tasks, navigating the learning environment and using multiple media for completing and presenting various assignments, etc. Therefore, it is not surprising that, in these areas, this study identified the obvious expression of a goal-directed and strategic learner. Under the conditions created by the teachers, the students responded to tasks and selected and used a variety of learning modalities (independently or in cooperative learning groups).

To become a full-fledged expert learner, it is necessary to ensure that the teacher's attention is focused on all areas, in accordance with the UDL strategy. For example, in the observed teacher activity, the teachers most often facilitated learners to interact with information in multiple ways. Such results of our study are also supported by the study of Schreffler et al. (2018). This study revealed that the teachers 'showed the most room for improvement on building competencies in the use of multiple options for students to express their understanding' (p. 362).

According to the UDL strategy, there is room for teachers to improve the field of executive functions in the Lithuanian context to develop a goal-directed and strategic student. Meanwhile, the essence of becoming an expert learner is the existence of coherence between all three UDL domains that are 'essential learning constituents: recognition of information to be learnt, application of strategies to process that information and engagement with the learning task' (Rose & Strangman, 2007, p. 382).

In the Lithuanian school, teachers' efforts to create an educational process that facilitates the development of strategic and goal-oriented students based on the UDL strategy was observed. Despite a rather critical position regarding UDL implementation during the first cycle of this study, the teachers recognised the value of the UDL framework at the end of the action research: 'UDL changes the system of education itself' (Teacher Goda, Inerview with the teachers, 2021). Moreover, the teachers indicated that they had undergone certain (although slight) transformations as teachers: 'I note that my restrained progress has taken place' (Teacher Goda, Interwiev with the teachers, 2021). The teachers also saw value in continuing to ground their practice on UDL's key components: providing conditions for student engagement, presenting the learning content in multiple ways and enabling the students to demonstrate their knowledge and skill acquisition in various ways.

They also established UDL as a useful framework for the development of a student-centred education system and practice. However, the process of implementing new practices at a school is always a complex process. The implementation of UDL as a new practice in the school context has been explored by many scholars

(Abell et al., 2011; Schreffler et al., 2018; Scott, 2018; Van Boxtel & Sugita, 2019). Successful implementation of the aforesaid strategy into educational practice requires support from school administration, familiarisation of the UDL strategy during the studies and in professional development programmes (Scott, 2018). Like any other new educational practice, teachers' attitudes and beliefs are involved. Therefore, to implement a successful UDL strategy in Lithuania, it is important to acquaint future teachers with this strategy during the study process. As the case study in Lithuania shows, the application of the UDL strategy transformed educational practice by responding to the educational needs of each student. UDL can provide excellent educational access for other countries that, like Lithuania, create and develop an inclusive education system.

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Chapter 9
Implementing UDL: Development of Purposeful and Motivated Students

Eglė Stasiūnaitienė and **Julita Navaitienė**

Abstract The assurance of purposeful and motivated learning activities in educational practice has been explored for many years. The essence of purposeful learning, which combines the goals of both teachers and learners, is to focus the participants of the pedagogical process on positive pedagogical interactions and mutual progress. The learner receives a package of knowledge, skills, behaviour and values important for socialisation from the teacher, whereas the teacher ensures confirmation of the quality of their own activity through pedagogical interactions. This chapter presents the results of a study aiming to answer two research questions: (1) What qualities and abilities of a purposeful and motivated expert learner are developed by applying the universal design for learning (UDL) approach? (2) How do educational factors facilitate the development of a purposeful and motivated expert learner by applying the UDL approach? In answering these questions, the processes occurring in the context of Lithuanian education were studied.

Keywords Purposeful student · Motivated student · Learning strategy · Universal design for learning

9.1 Introduction

The authenticity of students and diversity of learner identities determine the important goals that are set for teachers. Students differ in their social experiences, abilities, physical and emotional development and skills; they are also characterised by different internal and external motivational factors that encourage purposeful learning and adequate reaction to challenges. When a student receives support in overcoming challenges, opportunities are created to formulate individual goals and achieve learning success (Meyer et al., 2014). Goal-seeking students seek meaning

E. Stasiūnaitienė (✉) · J. Navaitienė
Educational Academy, Vytautas Magnus University, Kaunas, Lithuania
e-mail: egle.stasiunaitiene@vdu.lt; julita.navaitiene@vdu.lt

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and ask the 'why' of learning, such as the why of the learning content. These students are characterised by self-regulation and are able to clearly recognise how their learning activities meet their learning goals (Meyer et al., 2014).

According to Crimmin (2012), when learning objectives are directly correlated with essential real knowledge and skills, students become enthusiastic and motivated for personal and learning progress. Motivated students often associate teaching content with meaningful and acceptable practice and experience. Enthusiasm and interest are essential qualities of a motivated learner.

Skoglund et al. (2020) clearly reveal a link between students' positive behaviour and attitudes towards targeted active learning. The goals set by the learners themselves become a decisive factor in their planned learning activities. The individual goals of the student usually depend on their interests and needs, as well as the meaning of the learning. Peel's (2020) study reveals the potential of teachers combining targeted teaching with the targeted involvement of learners in daily learning activities. Student motivation deals with a student's desire to actively participate in the learning process. Student motivation to learn is construed as a student tendency to find academic activities meaningful and worthwhile, and to try and get the intended academic benefits from them. Debarger et al. (2017) indicate that targeted experiential and practice-based curricula can help students become more involved in the learning process, whereas challenges in the pedagogical process can enhance their motivation and improve their performance. Meyer et al. (2014) indicate that a purposeful, motivated and self-directed learner possesses the following characteristics: they understand how to plan resources, maintain effort and resilience to achieve learning goals; they seek to formulate complex and creative learning goals that facilitate the learning process; they realise that not only the learning process but also their achievements and performance results are important; they monitor, analyse and regulate their emotional–psychological reactions, which can act as a barrier to successful learning and involvement into the learning process.

In Lithuanian educational practice, it is common for teachers to not sufficiently mediate and develop these skills in students. Lithuanian educational documents (Law on Education, 2011), including the National Education Strategy for 2013–2022 (2013) and the good school concept (2015) highlight the ideas of a 'school for all', as well as the need to take into account the individual needs of the student and to ensure the importance of learning assistance. Because improving student performance is a national priority, the National Progress Strategy 'Lithuania 2030' (2012) has the goal that by 2020, at least 50% of Lithuanian 15-year-olds should achieve the third (out of six) reading, mathematical and science literacy level specified in OECD PISA (2015). This expected breakthrough did not happen—students remain below the 50% line, while the science literacy indicator has actually declined. Annual Report (2020) notes that individual needs must be recognised, here met by appropriate measures and monitored in every student. The Law on Education of the Republic of Lithuania (2011) states that the purpose of learning achievement evaluation is to help a learner self-check their learning progress, ascertain their achievements and assist them in making decisions on further learning or activities. It is obvious that a purposeful and self-directed learner realising their needs in the

learning process is still a relevant goal in the Lithuanian education system. Despite these needs being defined in legal documents, the reality shows that students are often demotivated by an inability to recognise the learning progress. Therefore, it is very important for students to be able to choose several strategies for learning and making progress, as well as for assessing their achievements.

Universal design for learning (UDL) is a teaching and learning strategy that helps develop student motivation and a purposeful learner. UDL ensures that teachers plan and implement the teaching/learning materials so that every student learns successfully and makes progress. Teachers applying this learning design do not wait for students to fail and stop making progress or begin to face difficulties in learning but instead prepare the teaching plan to be compliant with the students' needs at the beginning of the learning process (Meyer et al., 2014). Taking into account the problems set out above, the UDL strategy was tested in Lithuanian practice. It was investigated how this strategy creates the preconditions for developing a motivated and purposeful learner, thus ensuring the practice of inclusive education.

9.2 Methodological Underpinnings of the Research

The data analysis presented in this chapter is the result of a larger study (see Chap. 3). The analysis is based on examples of cooperation and field notes made in the 2018/2019–2019/2020 school year at Vilnius Balsiai Basic School. The study involved sixth–seventh-grade students (including 12 girls and 15 boys) and teachers (two women). During the study, both students and teachers became acquainted with UDL for the first time and tested the principles of this strategy in practice. The context of the research is that the teachers were introduced to the UDL strategy for the first time at the beginning of the research (Cycle 1), and they applied it throughout the whole research period (cycles 2 and 3). The action research cycles are presented and discussed in Chap. 3. This chapter provides a summary of the action research, combining the analysis of the survey data from the lessons (natural classroom environment) and distance learning (in the COVID-19 pandemic situation). The following data collection methods were used: observation, student and teacher interviews and teacher and researcher reflections.

We set the goal of answering the following questions: (1) What qualities and abilities of a purposeful and motivated learning expert are developed by applying the UDL approach? (2) How do educational factors facilitate the development of a purposeful and motivated learner using the UDL approach? Answering these questions, we could analyse what phenomena, interactions, dialogues, expressions of behaviour and so forth allowed for identifying the different aspects of student and teacher activity that determined purposeful learning and motivation, as well as improving the qualities and skills of a motivated student. The analysis of the research data revealed significant findings, which are summarised in three groups and which are important in the development of a motivated and purposeful learner. Taking into account the principles of the UDL strategy, we defined such groups as *interest,*

effort and persistence and self-regulation. The following section will discuss how interest, self-regulation, effort and persistence could be developed in the educational process from the perspective of the student and teacher.

9.3   What Does it Mean to Be an 'Interested Learner'?

Interest encourages learners to ask questions and participate in learning activities. This provides students with positive energy, increasing their attention and involvement in the pedagogical process. Interest in learning activities and active participation in the pedagogical scenarios offered by teachers allow for achieving higher academic results and the learner to change. We identified that the following preconditions are significant for supporting the learner's interest: concerning/questioning, actively participating, investigating, making choices and working independently.

The characteristics of strongly motivated learners are associated with a *concerning and questioning learner*. The synthesis and interpretation of the observation data of the learners' engagement provided a clearer understanding of the students' abilities as purposeful and motivated learners. When learners ask questions, they become involved in meaningful learning. Learners who are asking questions will also have enhanced learning potential. During the study, the learners demonstrated their need to ask questions. In some cases, the learners' questions revealed their desire to learn more deeply and learn more about the topic.

> *A remote Lithuanian language and literature lesson is taking place (COVID-19 epidemic situation). Kotryna presents a topic about the partisan movement in Lithuania. After the presentation, Liutauras asks, 'I have a question—is there anything new that you have learned?' Kotryna replies, 'I have learned that so many people died—about twenty thousand'. The teacher is joining the conversation, 'Don't you see the positive consequences of the partisan movement?' Kotryna, 'They prevented the Soviet army from advancing'. (Observation, 7 May 2020)*

The teacher motivates the students with her questions, inviting them to get involved and discuss the topic. The students' motivation and interest were enhanced by learning through participation in discussions, as well as by providing questions to the teacher and each other. The aim of the learners' questions was to understand the given content, to detail the objectives of the task, to find out the content of the activity, to find out the expediency of the chosen strategy, to explain the features of the task and so forth.

When learning to work and achieve goals together, an *actively participating* learner becomes an important source of personal change. In this way, new individual and group experiences can constructed, personal knowledge created and individual and social skills established through cooperation. When learners participate actively in classroom activities, they empower themselves in learning and interpersonal interactions. In the current study, active participation of the learners in the observed lessons not only revealed their engagement, but also motivated them to think critically.

In the English lesson, the teacher shows a slide with containers for food. She instructs the students to talk to a friend about what containers they might be and what could be stored in them. Students fill in the forms provided, in which they need to enter the correct information about the type of container in English. They provide a few words and an example. The students consult with each other and use the phone to search for the right words. They discuss in what kind of container soup can be stored. The students repeat the names of some of the containers together. The correct names of the containers are chosen during the discussion. (Observation, 5 December 2019)

The observed pedagogical process focused on both individual and group learning. To balance individual growth and success with responsibility towards the group, a pedagogical approach that focuses on collective rather than individual empowerment for learning activities is important. Collaborative learning reduces stress (both individual and group), which is also a prerequisite for motivated involvement in the learning process.

A student interested in learning is characterised by the ability to *investigate* the world around them and discover things that they find important. Students inevitably learn by exploring. Inquiry-based learning is fun and engaging and motivates learners to share ideas and discuss the findings and seek new ways to apply the existing information, while also giving students an opportunity to reinforce their interest through making decisions and working cooperatively with others.

A Lithuanian language and literature lesson is going on. The topic of the lesson: Analysis of the content of Lois Loery's book The Sender. *The students perform an analysis on the basis of the texts distributed and the work of previous lessons. The students need to find at least two issues that are relevant to today's society ... several examples need to be found from* The Sender *(researcher's note: the characteristics of the main character) and current society. (Observation, 12 December 2019)*

This situation shows how during the observed pedagogical process, active learning combined with inquiry was applied as a learning strategy. This is largely an experiential form of exploratory learning relevant to the development of a student's expert skills. As students explore and develop a metacognitive understanding of their learning, they develop not only an understanding of the subject content, but also new skills and an understanding of themselves.

We identified that making well-grounded and conscious choices fosters learners' metacognition and self-confidence. *Choice making* invites learners to engage more thoughtfully with the learning process. The possibility to have choices in how students learn and how they demonstrate their learning was a way to enhance the learners' responsibility for their own learning.

Teacher Alma: I tried to present the material in more than two formats (written text, video with subtitles, recorded text), supplemented by the teacher's explanation. This allowed different students to maintain their interest as at least one format of the learning material complied with their interests and preferences … The use of technology increased interest as it provided access to authentic material (BBC and CNN websites, webcasts, YouTube channel). The learning material became (COVID-19 epidemic situation) livelier and was not merely limited to the paper format (Padlet, Liveworksheets, educational websites with interactive tasks). The majority of the selected websites had the functions of converting a text to speech or recording the oral text, thus giving the students an opportunity to learn to

pronounce correctly and helping those with knowledge gaps or speech disorders. (Teacher reflection, 8 April 2021)

There cannot be a universal learning strategy for each student. The ability to choose from a variety of teaching and learning methods and their combination helps maintain focus and interest, facilitates the memorisation of knowledge, influences learning motivation and improves the skills of the student expert.

Independent work and self-confidence develop the student into a motivated and individually experimenting learner. One of the positive aspects of independent learning is the learners' ability to work on their own with confidence and minimal guidance. Autonomy in the learning process leads to greater opportunities to plan and manage their own learning. In this way, preconditions are created for the development of responsibility for independent choices.

> *Teacher Alma: An interesting observation was when ... gifted girls said: 'And it's very good for us sometimes to sit down and do an exercise, just to fill in the word' because they're probably just tired of having to work in a group and make some product during each lesson. ... says, 'Sometimes we want to do the work alone; we don't want to work in a group' ... sometimes it can be redundant (researcher's note: collaboration). (Teacher reflection, 26 March 2020)*

The more independent the students are, the easier it is for them to set learning goals, make decisions, identify their learning needs, take responsibility for constructing and implementing their own learning, monitor their progress towards their own learning goals and self-assess the learning outcomes.

Adopting innovations and challenges fosters curiosity and maintains interest. Innovation is a challenge in and of itself. Innovation means change, and students seek change; they value new ideas and actions. The example below demonstrates how students are involved in activities using Edward de Bono's six thinking hats.

> *The teacher distributes hats in six colours. According to the colour of the hats, the students express emotions or react in an assigned way to the work done by their peers. Red hats mean that the students in that group express their emotions evoked by the book review, those wearing green hats look for original thoughts in the review, white hats mean that students observe neutrality, black hats critique, yellow hats appreciate the work of colleagues, and blue hats summarise the activities of the whole class. (Observation, 5 November 2019)*

For some learners, accepting innovation and challenges may be seen as a risk. Experiences in group communication, fear of failure, waiting for the assessment of unfinished homework, demonstration of inappropriate behaviour and so forth can be associated with risks in the educational process.

> *Teacher Goda: A very creative class. If you give them those opportunities, they open up a lot. I haven't finished a course of folk songs yet, which was supposed to be very boring, yet it's not very boring now, and it's such a relaxation for me; they (researcher's note: students) really open up ... Steponas brought a stone, he wanted to sing alone ... he sang the song 'Stok ant akmenelio' solo ... he carried that stone, and the class rated it as the best ... although it was not the best—the student sang alone! He was quiet, does not have very good singing abilities, but they (researcher's note: students) (researcher's note: assessed) very differently ... and it is very valuable that they reveal those talents. (Teacher interview, 10 May 2020)*

By accepting the innovations and challenges offered in the learning process, students go beyond the limits of personal comfort. The ability to establish and maintain a safe and adequate relationship with the environment and not to be afraid of environmental pressures is one of the characteristics of a purposeful and motivated learner.

9.4   Maintaining the Learner's Interest

Interest is an essential motivational component for academic success; teachers' attempts to foster interest are important, whereas the stimulation of interest facilitates a more engaged and motivated learner. The following preconditions of the educational process are significant for supporting a student's interest: challenges selected by the learner, awards for participation, diversity of methods and tools for learning, applicability of knowledge and the participation of a learner in setting the learning goals.

One of the challenges for teachers is *creating challenges for learners*. The teacher is required to be creative and flexible enough to generate challenges and learning conditions that are acceptable to the learners.

> *Teacher Goda: The initiative of children (researcher's note: applying UDL) strengthens as long as they are willing to participate; the process is ongoing. … Today, Kotryna (researcher's note: the student does not have the qualities of a leader) introduced a folk song; it was a romance, all of them (researcher's note: students) with scarves, long skirts, movements… arrangement…. and…. I suddenly see that she started … I suddenly see that the initiative in Kotryna's hands—everything is still good … and she stands in the middle (researcher's note: of the class). I think—if only they had the initiative … the joy of learning and initiative, even if not every day; it is impossible to achieve it every day. (Teacher interview, 10 May 2020)*

In this case, the challenge is related to the purposeful use of the role, time, environment, experience and proper vocabulary. In completing the task, students must use basic knowledge and skills and relate them to newly presented information about folklore and traditions. Doing this evokes both students' thoughts and feelings, encouraging them to delve deeper into the meaning of the phenomenon and understand their relationship to the phenomenon. The learner's task is not only to learn the learning content, but also to become aware of the relationship between this content and their own experiences. This arouses interest and a desire to act.

Giving awards for effort is a significant factor in enhancing extrinsic motivation. The award applied by the teacher was identified during the observed lessons, which was manifested through a system of pluses for active participation and work in the lesson or public praise. The pluses allowed the learners to accumulate part of their cumulative marks.

> *Teacher Goda: 'Sit down with your third hour friend and write three epithets'. The teacher assists her partner (researcher's note: the teacher joined a learner who did not have one).*

The children are working. Gritė and Monika read what they have written. The teacher: 'Pluses for both of you'. (Observation, 30 January 2020)

The observed lessons were dominated by a plus–minus system or verbal praise. Improving the classroom motivation system, it would be valuable to look for other alternatives that act as motivational tools to help students feel successful and receive support.

The diversity of methods and tools for learning is critical to the overall well-being of the class and academic success of students. During the researched lessons, a variety of teaching methods used in the pedagogical process created the preconditions for conveying teaching content in various ways. For instance, in one lesson on the Lithuanian language and literature, we identified the learning methods that kept the learners engaged and active in the lesson. The learning methods included the following: presentation of the group work (researcher's note: a drawing, a poem); presentation of a video—a fragment of screening the book; text analysis; pair work; sentence matching; additional questions of the teacher for clarity; and a drawing of a composition about a perfect future society. The teacher was constantly involved with the students in the educational process, and she was modelling individual tasks and creatively encouraging them to learn.

Teacher Alma: I see what I have changed in myself ... I used to think, 'Oh, what are they going to create for me here, what kind of song; Oh, let the primary students create those songs, maybe the fifth-graders ...', but when you give them a chance ... You do what you want and as you want—but you have to use such structures, keep to such a theme, you have to show what you have learned—then a song or footage seem all right ... there are children ... who have tried something unconventional, such as creating a video. Earlier, it usually ended up with a PowerPoint presentation or a poster. (Teacher interview, 10 May 2020)

The harmonisation of teaching methods has emerged as a great strategy not only to creatively organise the lesson process, but also to take into account students' individual ways of obtaining and understanding information. The same method can perform the function of a teaching method in one pedagogical situation or become a constituent methodological part in another, that is, it can be an integral part of other methods.

The possibilities for *knowledge applicability* in the educational process are created through interactions and activities that encourage the application of one's old knowledge and creation of new knowledge. In this case, learning becomes constructive and self-regulating. This provides an opportunity for students to construct knowledge, interpret it and solve practical problems.

During the English lesson, learners listen to a recording of a dialogue in a store. Learners note what is being said and what will be bought. The teacher asks who has heard and what will be bought. They examine the text that contains the answers to the task. The teacher asks additional questions from the recording. ... When you go to the store, make a list of what you will buy using the words you have learned from the recording. You can get started now (researcher's note: making a list). (Observation, 11 December 2019)

The teacher consolidated the learners' knowledge by setting this task. The content of the lesson was approximated to an everyday situation: shopping. By

discovering the practical uses of the acquired knowledge, the learners could better retain the information. Thus, learning became more motivated and purposeful.

Creating a safe space and safe relationships was one of the most important things ensuring the *participation of the learner in setting the learning goals* during the lessons. Strengthening the students' motivation is influenced by the time allocated by the teacher to clarify the learning objectives. Then, students can see the meaning of learning, understand better why they have to participate in one activity or another and discover the added value of this activity. The teacher shares responsibility with the students for their learning and achievement.

> *Alma: The most striking change for me is that responsibilities are transferred, transferred to the student. In the past, the leader was the teacher, and you lead the whole parade. Now, you are trying to make it so that, under the leadership of that parade, they (researcher's note: students) begin to lead themselves figuratively speaking. And they start to get used to it, ... start thinking about ways they could do the same at home, for example: delve deeper if they haven't understood anything, find ways to adjust their learning a little, that it's not just the teacher, who assigns (researcher's note: learning content, work, etc.) ... this system (UDL) allows them to feel more responsible for themselves and recognise that the teacher is not solely in control (researcher's note: of the process). (Teacher interview, 10 May 2020)*

Teachers can design teaching strategies, tools and activities that best meet their intended learning goals. We identified that the conditions for group and individual goals were created by the teachers creatively organising lessons, alternating and coordinating educational activities, changing student seating and position and promoting cooperation and a good microclimate. It is important for the student to learn in a focused and result-oriented way while setting and achieving learning goals, which is a challenging learning task for the learner.

> *In the English lesson, the teacher asks, 'What could the purpose of this lesson be?' The children are silent. The teacher helps the students by saying that Nikita's (researcher's note: the student is unmotivated) goal could be to learn a few words and apply them in coherent sentences. 'What is the purpose of others?' The students do not respond. (Observation, 21 November 2019)*

During the research, we noted that the students did not have enough skills to define their individual learning goals. In this situation, an important educational aspect is the regular reminders of the teacher about the formulation of goals and success in meeting these goals. It is important to note that formulating personal learning goals must become an everyday learning skill.

9.5 Developing Effort and Persistence

Learning is intensive and hard work, and it is a process that requires energy, concentration and purposeful planning. The perseverance of learners is important when they have to continue their work or act purposefully, as well as when it is necessary to participate in uninteresting or difficult activities. In this case, there is the chance of encountering difficulties and failures. Not every learner is successful in

maintaining equal effort and activity in learning. Effort and persistence combine the following abilities of the student: *not reacting to interferences, looking for alternatives, asking for support when needed and performing and overcoming difficult tasks*.

Noise, different learning styles, focus on time, communication style, lesson organisation, its intensity, structure and so forth may become obstacles for a student in the pedagogical process. It is important for a motivated student to develop the ability to neither react nor respond adequately to such circumstances.

> *The children read a separate part of the given texts. Maikas reads and makes a mistake when accentuating; the teacher corrects, and Maikas starts reading slowly. There is silence in the classroom (researcher's note: support from the class is felt because the student has difficulty reading). Music is playing somewhere in the school territory. It is heard in the classroom and distracts the students. It is the last lesson, yet the students remain focused. (Observation, 11 January 2020)*

Another example includes the employment of a student's potential in time management.

> *The teacher, Goda, asks, 'Will we be able to listen to another person?' One of the students replies, 'Only 15 minutes are left'. (researcher's note: there are some more tasks left.)*
>
> *Pijus promises to read his work in three minutes. Pijus reads expressively and keeps looking at classmates. The class listen to him carefully. The class applause when he finishes reading. (Observation, 9 November 2019)*

Appropriate response or nonresponse to certain stimuli is a matter of habit. In the quotes above, the limitation of time may be a distractor because it is shorter than for other students. Here, you can see the student's ability to concentrate and 'manage' the learning situation.

Finding alternatives is the ability to react to and choose from the alternatives offered in the educational process. This is an important condition for the development of a motivated student. The opportunity of choice develops the student's creativity and engagement in learning.

> *The students were given the task of providing information about Lithuanian freedom fighters. They could choose how to present the material: write a letter, an essay or a message. One student chose to submit an essay, and the majority of students made presentations. ... Liutauras presents his work. There is a text and some photos. He remembers stories from his family. I have a short video. ... Liutauras shows a video. (Observation, 7 May 2020)*

The search for alternatives requires more time and energy from the learner, so the choice of alternatives is not always used; a simpler way to achieve the goal is chosen. The lack of choice of new learning and activity models can also be influenced by previous negative learning experiences when atypical and nonstandard choices have made the learner feel insecure.

> *The teacher recalls what she was discussing with the students in the previous lesson. She recalls that there were three ways to complete the homework assignment: (1) tell a story; (2) write a story; and (3) film a story. All students chose to write a story. In the observed educational process, students more often tended to apply the usual and tested ways of presenting their learning and performance. In developing the students' motivation, their purposeful voluntary decision making for atypical learning and activity demonstration models is important. (Researcher reflection, 5 December 2019)*

Requesting support when needed is an important precondition for the development of motivation. Not all circumstances in the learning process are conducive to achieving what has been planned. In the educational process, the student must face situations when the help of another person is needed. Therefore, a motivated and purposeful learner understands the need for help from others and should be able to ask for help, which is important in supporting the learning process and implementing the planned activities.

> *Remote English lesson (COVID-19 epidemic period). Maikas: 'Oh, I can't turn it on, my camera keeps turning off'. Maikas is reading what he has written with a lot of difficulty and numerous pauses, frequently mispronouncing. The teacher is listening. Maikas: What is 'meduolis' (researcher's note: gingerbread) in English? The teacher tells him. The teacher asks Maikas in English what the end of his story is. Maikas does not say anything and keeps silent. He is silent for a long time. (researcher's note: It is unclear whether he did not understand what the teacher was asking or disconnected.) Maikas joins again and says in Lithuanian, 'My phone is discharged. I will tell you the end soon'. He scrabbles for a long time, sighs and finally starts reading. The teacher helps him by asking questions, and she asks questions in English. (Observation, 19 May 2020)*

This episode demonstrates how the student–teacher interaction reveals a relationship based on trust: the student feels safe to make mistakes and ask questions, and the teacher is benevolent and helpful during the student's performance. Student–student interactions also reveal benevolent and sincere support from the group to the student, who finds it more difficult to present his work.

In developing learning skills, motivated students purposefully invest their time and resources in completing the task and achieving goals. In the long run, this should become a constant habit, providing satisfaction with the productivity and completeness of one's own work and *self-confidence in their own decisions*. The students are confident when they feel and realise that they will succeed in solving the tasks and achieving the goals they have set for themselves.

> *Teacher Alma: Steponas filmed himself once for a project on healthy food, reviewed it and said, 'Oh, and I mispronounced that, and I said nonsense in that place' ... he filmed himself four times before he liked the result. And when he told everyone that he had filmed it four times, he saw that the children were encouraged to improve their own work ... it opened my eyes that they were already mature enough to decide for themselves how good that work was for them. (Teacher interview, 26 March 2020)*

There is no single recipe for how to learn effectively and *overcome difficult goals* at first glance because this is influenced by the specificity of the knowledge to be learned, the experience and the emotional and physical well-being of the learner, as well as the diversity and specificity of learning activities.

> *There is a presentation given by Vaida. She says, 'I wrote 1.5 sheets instead of 1.5 pages'. She has reviewed Rowling's book* Harry Potter and the Chamber of Secrets. *The teacher says, 'Vaida wrote it like a ninth-grader'. The class declares that they want to hear the long text written by Vaida. She reads smoothly and expressively. Her review interests the whole class; everyone listens (even the students sitting at the back of the class), and the class is silent. When someone tries to talk, they are silenced by other students. When Vaida finishes reading, the class applauds. The red-hatted Timotiejus shouts loudly, 'Bravo!' (Observation, 14 November 2019)*

By becoming a motivated and purposeful student, the student learns strategies for managing and allocating time, how to complete tasks, giving as much meaning as possible to memorable information and using a variety of analogies, metaphors, summaries, diagrams, images and so forth.

> *Teacher Goda: I see how Timotiejus still tries to overcome the most difficult grammatical tasks …, I think and thank God … he puts effort to think with friends … and I think—you go into such a difficult fight, and I realise that everything is still good … (Teacher interview, 10 May 2020)*

In the presented episode, the student's motivation was clearly strengthened; the effort was focused on learning activities. Facing failure can lead to the strengthening of inadequate emotions and behaviour, as well as passivity in the learning process. Conversely, positive emotions, good mood, happiness, satisfaction and other emotions appear if the result that meets the set goal is achieved, especially if the task is complex and the student devotes a lot of energy and time to its completion after numerous attempts.

9.6   Creating Preconditions for the Learner's Effort and Persistence

Teachers play a significant role in helping purposeful and motivated learners to develop persistence; they can foster the learner's specific skills, such as organisational strategies, time management and realistic goal setting. Monitoring the learner's progress and fostering collaboration were observed in the teachers' activity, here trying to determine the learner's effort and persistence in the process of becoming motivated and purposeful.

Monitoring the learner's progress is one of the most important goals of a teacher. The teacher helps students grow because they are sincere, accept their own feelings, acknowledge students and demonstrate support. The provision of personal recognition and favourability is followed, which helps favour the student even when they make a mistake or fail to perform the assigned tasks. Students need to experience that personal relationships with teachers and classmates are not affected by their answers to questions or the completion of tasks. It is also important for students to experience that their answers are taken seriously, regardless of whether the teacher thinks they are the best or not.

> *Alma: … it's hard for me; it's very hard for me, especially in this class because it has kids with limitations: two kids with SEN (special educational needs), six kids with high talents, and there are a few completely unmotivated. As the gap between what they know and should know grows, the motivation does not increase; they do not enjoy as much as they did in the fifth grade… sixth grade … they realise that they fail. In the seventh grade, the gap is already widening, and I am worried. (Teacher interview, 10 May 2020)*

In the observed educational context, the efforts of the students and the chosen ways of working were praised, but not their minds or intelligence. Written

comments were also applied, confirming what the student was doing correctly and focusing on improving the work. The obvious activities of the teachers were related to the identification of mistakes or gaps and in improving the motivation of the student to correct these mistakes.

Fostering collaboration creates preconditions for learners' meaningful activities through a certain role and relationship with other members of the group. Models of cooperation were clearly recognisable: working in pairs, learning in threes, learning in a group, learning in pairs with a teacher, learning through roles and learning all together in a large group in the classroom.

> *Lithuanian language and literature lesson. Teacher Goda: 'Antanas, have you found friends? Hasn't Steponas found any? Who is free?' Steponas: 'I am free'. Teacher: 'Let's sit down with our first hour friend. I'll be in a pair with you'. (Observation, 11 January 2019)*

The focus, solidarity and success of a class as a group depend on the balance between achieving goals and maintaining good relationships with all group members. In the observed educational process, teachers were usually successful in ensuring the preconditions for group formation and maintaining the successful functioning of the class as a group.

> *Goda: Involving students at the beginning of a lesson or keeping students involved throughout the lesson was the most important part in motivating the students for learning. Raising interest at the beginning of the lesson through photos, videos, heuristics and practical 'bonuses' contributed to this a lot; yet frequent changes in lesson models, such as altering lessons based on acting and theatre methods, lessons involving outdoor work, various group work combinations and so forth were even more effective—the students managed to focus because they did not know what would happen next. (Teacher reflection, 7 April 20)*

The benefit of collaborative learning methods is that it encourages the consideration of an individual's emotional needs and feelings. It is important for the teacher to set a good example by both their own behaviour and sincere emotional relationship, as well as a willingness to collaborate. For the class to become a team and trusting group, the teacher must become a member of the team.

9.7   Supporting Self-directed Learning

The ability to manage reactions or states is an important aspect of self-directed learning and personal development. It involves the ability to manage external reactions or internal states by acting in the environment, as well as building and maintaining relationships with others. An individual by nature tends to observe and learn from the example of others and to form his or her own patterns of positive behaviour. There are situations in the pedagogical process where it is difficult for the learner to develop and maintain self-regulatory skills. Weak self-regulatory skills can affect a person's low level of motivation. Learners who have extensive self-regulatory skills can optimise self-directed learning. They develop the abilities of self-evaluation, management of emotions, positive expectations, choosing how to

learn, knowing their own strengths and weaknesses and can reflect on their own learning.

A learning environment in which students maintain safe and benevolent interactions allows them to share their individual views, experiences and advice. Feeling safe, students can challenge each other and express their opinions and assessments, including their own *self-evaluations*. Active participation connects students from similar social groups, thus creating the conditions for motivated learning.

> *The captain of the white hats comes in front of the class, sits down on a chair and reads the evaluations. Only some of them are based on arguments. … Black hats had not only to evaluate, but also to criticise. At first, Justė explains in great detail why such assessments are made, then only announces the assessment itself. ... Green hats criticise by evaluating. Pijus: 'He had to speak more expressively'. The student: 'I would suggest more eye contact'. (Observation, 28 November 2019)*

Joint activities and informal assessment of students' activities in accordance with the principle 'students assess students' encourage involvement and active participation. In this activity, the evaluator's ability to not only recognise the learning gaps of their classmate, but also express and substantiate their opinion is revealed. In this way, the student assessing the work of another student provides assessment from a personal perspective. In doing so, the student evaluates their achievements and recognises their weaknesses and strengths.

Positive expectations are related to the expression of students' emotions during the pedagogical process. The passage below shows how the teacher incorporates students' experiences and emotions into activities and creativity. This strengthens the level of motivation and involvement, as well as positive expectations. It can be seen that students enjoy learning when they can choose their own activities, when these activities are focused on their interests and when the activities are accompanied by creativity.

> *Teacher Goda: I suggest you imagine moving to the country where you have been or dream of being. Close your eyes, sit back comfortably, imagine a specific place, people you interact with, and what you are doing. The ways of travelling include your head and thoughts (Morta has her eyes closed; Maikas is laughing; Pijus leaves the meeting and then returns). Now, gradually, say goodbye to the place and people in your imagination, get out of your thoughts, and turn on the cameras. How did it work?*
> *Pijus: I did it for a short time.*
> *Arnas: I succeeded; I saw something.*
> *Teacher Goda: Show where you were on the map, Steponas (researcher's note: The student is not very good at showing).*
> *Steponas: I went to Belgium to a park that I really enjoyed. I talked to my mom.*
> *Teacher Goda: Did you like it?*
> *Vaida: Yeah, I really liked it.*
> *Teacher Goda: Liepa, and where have you been?*
> *Morta: I was in Bulgaria, in the White Bay, I photographed the sea, and I talked to people.*
> *Marija: I was in Australia: mountains, waterfall. It is a dream journey.*
> *Timotiejus: It didn't quite work out. I travelled to Portugal—my dream trip.*

It is obvious that the teacher gives enough time for reflection, encouraging the students to dream and remember. It liberates the students' creativity and fantasies.

They feel safe and actively engaged in a play of memories coloured by emotions and authentic and emotional experiences.

The processes of intuition and insight sometimes help learners see things differently. Insight and intuition are often based on experience and emotions. Creative thinking and memories are employed to enrich the learning context and make it more personal.

Choosing how to learn strengthens students' motivated learning and responsibility. We observed educational situations in which the teachers suggested several alternatives for learning activities, knowledge seeking and consolidation. This allowed the students to develop the skills needed to make the right choices for attaining their goals.

> *The teacher allows learners to choose: 'Your homework: you can either continue the situations or you can choose another task (shows the task on the screen). The second task is more difficult. Choose the one you want. You will get points for the second task'. (Observation, 7 November 2019)*

In this situation, the teacher gives a choice between more complex and easier homework. The students could choose to assess their abilities and the need to express their creativity and could get additional pluses. The wonderful benefit of choice is that as the work becomes more diverse, it is harder to be unmotivated and passive.

> *The task assigned: In five minutes, students have to write 200 words why the given text is a review. They can write where they want: on the bench, on the windowsill at the end of the classroom, in the corridor. Only four students remain at the tables. Kristupas stays alone at the first desk in the middle row. Some go out into the hallway, while others choose to work on the windowsill. (Observation, 28 November 2019)*

The possibility of choosing how to study expands the limits of the student's independence in the pedagogical process. A student who has chosen an activity independently is more responsible for the results of the activity, as well as being able to analyse their own learning process more deeply and individually.

Awareness of one's own strengths and weaknesses and reflection on one's own learning help achieve the learning goals. The current study revealed that the students differed greatly in their abilities and propensity for self-reflection. For some, these processes went more smoothly, and the necessary self-reflection skills developed more quickly. Others needed clear instructions and advice to try to do it successfully. It was possible to identify that individual learning goals helped the students engage in learning and become motivated, as well as helped develop their independence and responsibility while strengthening their motivation.

> *The teacher, Goda, asks how much time the students have spent on the Friendship Cake task. A student responds that several cakes have been drawn; this one selected. The student explains that the group members each drew a picture, then considered and decided together which cake to present. (Researcher reflection, 13 December 2019)*

This situation demonstrates that the group of students made full use of their potential and sought the best outcome for the task. Strong qualities of the students were demonstrated. Questions for reflection were usually asked at the end of the

lessons. Occasionally, the questions were asked orally and sometimes in writing. Below are some examples formulated from the students' written reflections in response to the following questions: What did you succeed in during the lesson? What did you fail at? What was difficult? What helped you cope with the difficulties? What was interesting that happened during the lesson?

> *Sofija: The rules were easy; it was hard to spell some words, and friends helped me explain the spelling of the words. While learning, I used the textbook and a pen. I answered everything correctly on the board, but I did not learn the limbs. I did not do my homework. ….*
> *Liutauras: I was curious to know what the coats of arms of the cities meant; my friends didn't help because I was sitting alone. I asked the teacher to explain what the signs meant (researcher's note: in the coats of arms); the textbook helped. I had no other means. It's fun to be able to give an answer about some of the city's coats of arms. The lesson was not tense anyway. (Students' reflection, 27 May 2020).*

The reflection on the generalisation of this lesson, entitled 'Partisan Movement', was initiated by the following question: What did you use to better understand what you were learning in this lesson and how? Why did this help you?

> *Saulius: I carefully read and followed the text of the lesson, watched the excerpt of the film and wrote down the essential things from the slides shown by the teacher. It helped me because I could take better notice and understand what I learned by writing down the information. I would see it in my notebook and remember it. (Student reflection, 20 May 2020)*

This practice of student reflection, here encouraged and supported by the teachers, is more a 'reflexive action', where the students constantly check what they have learned and what they have failed at after studying the new materials. It may seem that this way of learning is sufficient for the student to learn consciously and for the learning outcomes to improve. Yet, this way of reflection is quite static because it works only on a linear principle: 'I learned/I checked'. Although reflection takes place automatically, it makes sense to purposefully encourage and deepen it.

9.8   Strengthening Students' Self-regulation

By organising the learning process, teachers can improve students' ability to observe, regulate and control their behaviour, emotions and thinking. The following preconditions are significant for the development of a learner's self-regulation: modelling individual goals for the learner considering their strengths; monitoring the learner's cognitive, behavioural and emotional changes; and the actuation of the learner's self-reflection.

Proper self-assessment allows one to successfully function in the social environment and to establish healthy and safe relationships with others. It is a qualitative component of cognitive and personal expression. During the research, it was possible to observe the efforts of the teachers *to strengthen the students' positive self-esteem* and balance safe social relations in the group.

Teacher Alma helps Maikas repeat the essence of the task. She reminds him of the main words that have been said about the event: 'The festival is going on ... The event provides ....' The teacher writes in English on the board. She asks the students to take notes and explains to Maikas and Timotiejus (students with special educational needs) what the task is, what should be done and how. She waits for them to open their textbooks and explains the task. (Observation, 11 December 2019)

Goodwill and insight into learning needs, personal characteristics and the ways of doing things serve as preconditions for strengthening positive self-esteem. The observed educational context reveals the peculiarities of the teachers' positive relationship: timbre of communication, benevolent repetition of tasks or questions, encouragement to correct unfinished or poorly done work before positive evaluation, efforts to balance group relationships and goodwill and so forth.

Modelling individual goals for the learner by considering their strengths works much like a precondition for motivation. Each participant in the educational process fulfils their expectations by setting specific learning goals and striving to achieve them. The observed lessons displayed instances of purposeful communication in developing the learner's goals and analysing their strengths and weaknesses. The observed context of the lessons revealed several strategies of teacher activities in formulating the learning goals. The teachers provided them in writing (using a visual way of providing and receiving information), the goals were formulated verbally (using an oral way of providing and receiving information) and the goals were divided into smaller and very specific goals according to the students' personal characteristics, abilities and learning needs. There were some situations in which the students helped each other formulate individual goals.

Teacher Alma: It seems to me that they … when the lesson starts from setting the goal, now they tell it to themselves according to their wishes and level of possibilities: 'Maybe I will learn three words, I will understand ... maybe I will be able to apply those phrases in a sentence or in a dialogue' ... You can already understand from this that the children can assume responsibility for themselves, plan a little ... and at the end of the lesson they can think about it again, analyse whether they have managed to achieve the set goal, they can state, 'Oh, I used three words – I succeeded'. But when you ask the question 'What you could have done to make it even better or more?', they start making small methodological suggestions of their own: 'Ah, it would have helped me if the main thoughts had been underlined'. ... when they say such things, you can single out two or three things that would have helped them together. Then, in the next lesson, you try to do it and watch it work. This is what you learn by teaching, and you get advice from your children as to why you failed (Teacher interview, 10 May 2020).

Learning objectives were formulated for each lesson observed. In this way, the teachers created conditions for the development of skills to formulate the learning goals. This gradually became part of the classroom activities and a regular student practice at the beginning (formulating lesson goals) and end (analysing how they were achieved) of a lesson.

Monitoring the learners' cognitive, behavioural and emotional changes allows for identifying how teacher values and attitudes influence changes in student behaviour and learning progress. How does the teacher 'see' the students' situations? For

the teacher, how important are the progress of their students and change in their thinking and values?

> *Teacher Alma: The best example for me is Maikas. After the holidays, Maikas came back rested; his work level was completely different ... Now, his eyes are burning, and he wants to (study) ... what was happening the last month before the holidays is difficult to say, you could see the child was physically exhausted ... Now, he is recovered, he says what he wants, how he would have done; he is no longer lying on the desk.*

> *Teacher Goda: There are such difficult topics in my course now ... They have to be accounted for ... it would be difficult for an adult ... and as you think, now a teenager, ... needs to take note of everything … I don't know, you can lose your mind there, and you understand that teenager who says ... it's enough for me... I want to log out ..., after a while they get involved again ...and there will be topics that will be a challenge for all of us. (Teacher interview, 10 May 2020)*

The example illustrates how the teachers empathetically reflected on the students' situations. It reveals the teachers' interest, concern and insights into the students' emotional and physical health. Through their care, the teachers created a basis for an empathic educational relationship, which is a strong prerequisite for strengthening learners' motivation and improving their learning.

The actuation of the learners' self-reflection plays an important role in strengthening the learners' motivation and self-regulation. In an effort to help learners reflect on their experiences and the learning process and to understand what they want to achieve in it, teachers can use a range of self-assessment strategies and tools. During the observed pedagogical process, various support questions were mostly used that helped the teachers strengthen the learners' reflective skills. Educational strategies such as Edward de Bono's six thinking hats and assigning the role of optimists and pessimists to purposeful reflection during and at the end of the learning process were also used in the educational process.

> *The online lesson of Lithuanian language and literature on the topic 'Remembering the most important periods of defence of freedom' (COVID-19 situation) is in progress. The students will report on the prepared work. The teacher presents the assessment criteria. Content, important facts, originality, humour, ability to communicate with classmates and correctness of language will be assessed. The text must be written in the correct language; it is important to speak correctly. Additional points are awarded if information from family or kinship experience is provided and if the students actively ask questions during the lesson. The students have to choose the roles of an 'optimist', 'pessimist' or 'clerk'. 'Optimists' observe the positive things of the task; 'pessimists' look for negative things, whereas 'clerks' record the facts. (Observation, 04 April 2020)*

The pedagogical process shows that the teachers coordinate assessment and reflection processes in the lesson by assigning roles and asking clarifying questions. Discussions in pairs or small groups occur, and the students' presentations encourage the identification of their learning goals, which allow for 'trying out' their own attitudes and expectations. It also helps learners to share interpretations and personal attitudes.

> *The lessons of the Lithuanian language and literature and literature are in progress.*
>   *Teacher Goda: You have one minute to speak. Raise your hands. Which group is ready?*

The captain of the white hats comes in front of the class, sits down on a chair and reads the grades. Some estimates are supported by arguments …

The yellow hats say, 'Sofija gets 10 because her presentation was perfect'; 'Liutauras was very frivolous'; 'Pijus also 10'. (Observation, 28 January 2019)

Here, the teacher initiated discussions in pairs or small groups and encouraged the learners to talk reflectively about their learning goals and share them with others. Discussions were also used as a collaborative learning strategy. Awareness of both positive and negative experiences, naming and expressing feelings, successes and failures that had been experienced but not expressed enabled the students to control their reactions to learning barriers. We identified that the regular integration of reflection into the pedagogical process was an obvious part of the widespread pedagogical practice of the teachers.

9.9   Discussion and Conclusions

Searching for the answer to what qualities and abilities of a purposeful and motivated expert learner can be developed by applying the UDL approach and how educational factors facilitate the development of a purposeful and motivated expert learner by applying the UDL approach, the educational prerequisites for students' becoming purposeful and motivated learners were identified. The learners demonstrated their interest, collaborated, investigated, were actively engaged and were included in the process of learning. These qualities are considered important by Macgowan and Wong (2017), who research the development of group work competences. While pursuing the research goals and after introducing the features of the UDL strategy into the usual process of education, a pedagogical interaction was created, where learners shared their experiences and recommendations; this enhanced their motivation and contributed to their becoming motivated and purposeful. According to Barrineau et al. (2009), motivated learners create challenges to learn from each other, hence planning, implementing and evaluating their learning achievements together. Macgowan and Wong (2017) and Zirkus and Morgan (2020) emphasise that collaborative learning is as valuable as individual progress; it increases self-confidence (Chen, 2020) and enhances personal potential (Pejuan & Antonijuan, 2019), and the teacher becomes a role model of appropriate respectful behaviour in the process (Apaydin & Seçkin, 2013). It is important to note that challenges enable a deeper understanding of the analysed phenomena and enhance the pupils' relation with the environment (Davis & Sumara, 2002; Kaukko & Wilkinson, 2020), whereas the purposeful choice of learning and behaviour can strengthen motivation (Anderson, 2016). The learners' persistence, desire to continue the started activities after encountering challenges and efficient targeted efforts are perceived as an important part of individual learning strategies that can be used by learners while pursuing individual learning goals (Saphier et al., 2008).

Evaluating the context of the observed lessons, the learners chose tested and usual ways of presenting the learning results. It should also be mentioned that some

lessons were observed during the COVID-19 pandemic and, according to Ebner and Gegenfurtner (2019), in such a situation, the learners could have been less engaged in their learning. Setting learning goals and attainment is a complex learning assignment; therefore, a student must be ready to provide a motivated contribution and put in effort (Ng, 2020; Crimmin, 2012; Sullo, 2009). In the context of the research, the need for improvement of the teacher's and learners' construction of goals and their compatibility was identified. The research material of Huitt (2003) emphasises that students should independently choose their learning goals because then, they invest more effort, work more intensively and better retain and apply what they have learned. The research results published by King and Bunce (2020) substantiate the data of the conducted research that a positive attitude towards learning goals and interest in assignments can influence learning motivation, which strengthens students' attention and maintains their academic achievements (Wong & Wong, 2019; Alexander, 2017). The educational process planned together by the teacher and students, which Wiliam (2011) refers to as co-creation, undoubtedly preconditions the successful transformation of learners into expert learners. In the current study, the purposeful efforts of the teachers to formulate goal-based teaching were observed, but learner goal setting remained an element of the UDL strategy that was not completely implemented.

During the present research, sufficiently enthusiastic learner behaviour and openness were identified when they participated in the dialogues with teachers and in the lesson scenarios suggested by the teachers, which encouraged learners to investigate, construct experiential knowledge and informally evaluate their classmates. Because evaluations are conducted according to the previously discussed success criteria, informal peer evaluations occur in the context of personal achievements and progress, that is, the level of the students' own learning is also self-assessed (Wiliam, 2011). Every dialogue with pupils and their engagement in the learning process and evaluation is an indicator revealing an understanding of the knowledge and efficiency of the chosen teaching methods of a teacher (Kang & Keinonen, 2018; Black & Wiliam, 2009). Teaching methods predetermine the academic success of learners and their general well-being in the classroom (Silver et al., 2009). Moreover, informal verbal evaluation has a stronger influence on learners compared with written evaluation (Hattie, 2012; Whitney & Ackerman, 2020). In the current study, the openness of students and expression of their safety while asking for help from teachers and friends were analysed by observing the class as a system; however, a deeper analysis allowing for identifying the correlation of individual safety with the class/group microclimate was not conducted.

However, it is worth planning such research because Broom (2015) and Bartolucci and Batini (2020) state that in seeking to balance students' individual growth and success with responsibility towards the group, there is a need for pedagogy to be oriented not towards collective but rather individual empowerment. Individual features and abilities to cope with such barriers were characteristic of the students in the current study. In the present research, episodes were noticed when students faced problems trying to keep their attention or finish the started assignments. Increased activity and inclination to make noise, impulsivity, contradicting,

impolite behaviour and other actions were also noticed. Similar features of weakened self-regulation were distinguished by Hallahan et al. (2015), whereas Liman and Tepeli (2019) and Zhang et al. (2020) emphasise the particularly significant role of a teacher seeking to improve pupils' skills to observe and control their own behaviour, emotions and thinking while pursuing learning success. Strong self-regulation is directly linked to the independent accumulation of knowledge, use of obtained experience and the self-assessment of and reflection on learning (Hall & Simeral, 2017).

When learners explore and develop a metacognitive understanding of their own learning, they not only develop understanding of the subject content, but also create new skills and self-understanding (Cook-Sather, 2009, 2016), as well as learning to behave by perceiving their experiences (Chapman & Mitchell, 2020). When academic knowledge is combined with practice and experience is reflected, it becomes more meaningful because it complies with learners' interests (Bovill, 2020, Kressler & Kressler, 2020; Morley, 2008).

It is obvious that self-evaluation, management of emotions, knowing of one's own strengths and weaknesses and reflecting on one's own learning are important abilities for pupils' becoming motivated learners, but the analysis of the reflection content and observation data show that these areas require improvement. Reflection as a phenomenon has been acknowledged in the culture of the Lithuanian education system, but it is not a frequent strategy for qualitative changes in teaching and learning throughout the pedagogical practice. Interest is an essential motivational element of academic success; therefore, in the current study, teachers' attempts to evoke interest were justified and obvious. It should be noted that the teachers planned teaching strategies, tools and activities, which, according to them, met the set learning goals the best. This is also emphasised by Debarger et al. (2017). When introducing UDL (as an inclusive education strategy) into Lithuanian pedagogical practice, it would be useful to direct more attention to setting one's own learning goals and have the challenges selected by the learner while giving awards for participation when striving for systematicity and periodicity in the classroom.

The current research allowed for identifying the data on teacher professionalism in the processes of monitoring the learners' progress, fostering collaboration and supporting the learner when he or she asked a question. Timely reactions to the students' interests, encouragement of the learners to identify the strong and weak sides of their own work and establishing the ways of their own improvement are the highest quality responses in the teacher–learner dialogue (Byman & Kansanen, 2008; Boekaerts & Cascallar, 2006). This enhances a learner's feeling of self-esteem (Coffey & Warren, 2020; Russo et al., 2019), especially when the teacher contributes to the learner's growth because the teacher is being sincere, open to their own feelings, accepts the learner and demonstrates unconditional agreement (Peel, 2020; Bingöl & Batik, 2019). In the current study, the observed teachers' activities obviously revealed their regular and long-term efforts in confidence-based relations with their students, which supplemented the 'portfolio' of a motivated learner's qualities and abilities with reflection skills and practice in a targeted way. It is noteworthy

that the teachers strengthened their inclusive education practice skills by implementing UDL.

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Chapter 10
Teaching for Diversity with UDL: Analysing Teacher Competence

Suvi Lakkala ⓘ **and Outi Kyrö-Ämmälä** ⓘ

Abstract This chapter is a description of collaborative action research on teacher competence in the context of inclusive education and universal design for learning (UDL). Our goal was to analyse what kinds of professional competencies teachers need when they are implementing UDL in heterogeneous classes. The action research was carried out as a case study together with two co-teachers and a class teacher, who implemented UDL in their heterogeneous classes. As a theoretical framework for teacher competence, we used the multidimensional adapted process (MAP) model of teaching, developed by Finnish researchers and teacher educators. We identified several teacher skills that are needed when the UDL approach is applied. According to our results, the most overarching necessary competence was the teachers' cognitive skills. Applying UDL required the ability to flexibly transform one's own teaching and learning situations. Furthermore, the teachers' social skills appeared as an important attribute as their pupils were highly heterogeneous with diverse needs, and the teachers needed to collaborate with many other professionals and parents. Also, each teacher's personal orientation, such as values, beliefs and ethics, played a crucial role in UDL while the teachers shared a common set of values, striving towards inclusive education.

Keywords Action research · Inclusive education · UDL · Teacher competence · Teacher's values · Teacher's skills

S. Lakkala (✉) · O. Kyrö-Ämmälä
University of Lapland, Rovaniemi, Finland
e-mail: suvi.lakkala@ulapland.fi; outi.kyro-ammala@ulapland.fi

10.1 Introduction

The goal of inclusive education is to create a process that enables students to learn in their own learning community (Slee, 2014) and allows students to reach their full learning potential (Booth & Ainscow, 2011). For many, it also means feelings of belonging to your school community (Qvortrup & Qvortrup, 2018).

Yet, there is a paucity of literature about how inclusive pedagogy should be enacted in classes (Florian & Spratt, 2013). Many researchers have criticised inclusive education particularly concerning its practical realisation as it simplifies the complicated reality and students' heterogeneity (see, e.g. Norwich, 2013). In heterogeneous classes, teachers often confront obstacles in resources, such as time, materials, physical class spaces and personnel (Lingard & Mills, 2007). Many teachers find it demanding to consider students' various interests and preferences for studying in groups or alone (Joseph et al., 2013). There is a danger that many students with diverse needs may be left without support, if the teachers in the mainstream classes are not able to teach diverse students (Lumby & Coleman, 2016). For example, in Hienonens et al.'s (2018) large-scale longitudinal study, the learning outcomes in classes with students with special educational needs (SEN) and students with any additional needs, both groups performed on mean lower than the students in classes without students with SEN.

Inclusive education in mainstream classes needs teachers who are able to do flexible solutions in constructing the learning environments for all their students. According to Buyse et al. (2008), the core dynamic is indeed on teachers' professional skills and supportiveness, which positively influence the school climate, learning processes, academic outcomes and non-conflictual relationships in the classroom. Spratt and Florian (2015) see the inclusive teacher's relevant competence as the ability to support each individual in the context of 'everybody'. Tjernberg and Heimdahl Mattson (2014) argue that teachers who implement inclusive education have a positive belief in their students' abilities and that they are committed to teaching everyone. In the context of inclusive education, a teacher could be seen as an educational designer, who is able to be a reflective practitioner and to develop her/his own work guided by inclusive values (cf. Nielsen & Andreasen, 2013).

In this chapter, we are interested in what kinds of teacher competence is needed when teaching diverse pupils in an inclusive school. According to Koster and Dengerink (2008), teacher competence includes a combination of knowledge, skills, attitudes, values and personal characteristics that allow the teacher to act professionally and effectively in particular teaching and learning situations. In this chapter, we describe our collaborative action research on teacher competence in the context of inclusive education and universal design for learning (UDL). The main goal of UDL is to make educational environments at all levels more inclusive. The values of the UDL approach indicate appreciation of the variability and diversity of learners (Rose et al., 2014). Thus, UDL can be seen as quite a comprehensive pedagogical approach of inclusive education (cf. Jimenez & Hudson, 2019). As such, it can help

to cover the gap between inclusive ideals and practice. Even though there has been an increasing number of studies on inclusive educational settings, research focused on the skills and knowledge of qualified inclusive teachers is still scarce (see, e.g. Florian & Black-Hawkins, 2011). With our research, we aim to fill this gap.

The research was carried out as a case study together with two co-teachers and a first class teacher, who implemented UDL in their heterogeneous classes in Finland. In this chapter, we analyse the pedagogical activities of the adults who participated in our research. We collaborated with the teachers by acting as researchers studying their teaching, and as mentors helping the teachers to develop their pedagogy as they started trialling UDL in their teaching.

10.2   UDL and Teacher Competence in MAP Model

In analysing teacher competence in this study, we will utilise the theory-driven multidimensional adapted process (MAP) model of teaching developed by Finnish researchers in the project Student Selection to Teacher Education in Finland – Anticipatory Work for Future (Metsäpelto et al., 2020). The MAP model is based on the research by Blömeke, Gustafsson and Shavelson (2015), and it has been developed in the context of Finnish university-based teacher education. The teacher educators and researchers from Finnish teacher education units participated in the development of the model by reviewing literature. Like Blömeke et al., they see teacher competence as a multi-dimensional continuum expanding both horizontally and vertically. The MAP model combines the *teacher's dimensions of competence* and the *situation-specific skills* that are used when applying one's *pedagogical practices*. Finally, the model considers *teacher effectiveness on the students' level* (see Fig. 10.1).

Our purpose is to identify the cognitive and the non-cognitive – that is, the affect-motivational latent – factors in teacher competence through the analysis of teachers', TA:s' and pupils' observed performance in the research classes and their perceptions of teaching and learning that took place in the classes.

In our study, the UDL approach represents the *observable professional practices* of the model. By analysing them, we will detect the *situation-specific skills* related to UDL and through these we will draw on teacher competence. The MAP model sees the pupils' experiences of *learning, motivation and well-being* as a sign of the teacher's effectiveness. The students' perceptions are important indicators of the effectiveness of the UDL approach implemented in the research classes.

The MAP model identifies pedagogical practices at the individual and group levels and at the organisational level as well as at the local, national and global levels (Metsäpelto et al., 2020). On the national level, Finland's compulsory education is organised quite unanimously, and the general principles governing education and education policy are planned, outlined and implemented by the Parliament, the Ministry of Education and Culture and, as part of the Parliament, the Finnish National Board of Education (Ministry of Education and Culture, n.d.-a). However,
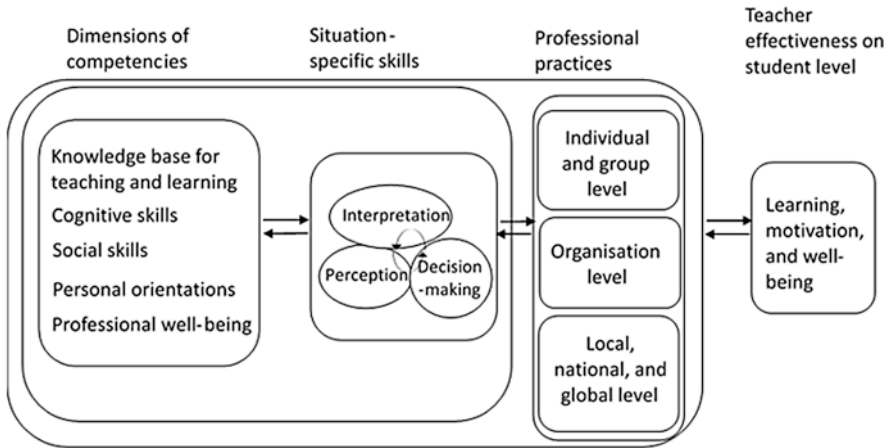
Fig. 10.1 Multidimensional adapted process (MAP) model of teaching (Metsäpelto et al., 2020)

locally, the Finnish municipalities are allowed to apply some curricular features that are considered characteristic to the specific region (Finnish National Agency of Education [FNAE], 2016).

In Finland, all people have the right to education free of charge in accordance with their abilities and special needs. Compulsory education begins the year children turn 6 and ends the year when they turn 17. All the students who have completed their compulsory education have a right to continue their studies either in general or vocational upper secondary education. The Basic Education Act (628/1998) sets the principles and norms of basic education (compulsory education). There are no national tests for students, and the nature of the evaluation of learning outcomes at schools is encouraging and supportive (Ministry of Education and Culture, n.d.-b). The compulsory education is steered by the National Core Curriculum for Basic Education, which forms the national framework for the local curricula. The local education providers are responsible for the local curriculum and also for providing early childhood education and care, pre-primary education and basic education to all who live in their municipality (see Ministry of Education and Culture, n.d.-a; Finnish National Board of Education, n.d.). The Finnish educational policies expect the teachers to organize the support for their students in collaboration with other teachers and professionals at schools. In general, it can be stated that the Finnish teachers' pedagogical position is autonomous as they have freedom to decide about many pedagogical issues and practices themselves.

Relevant to our case's pedagogical practices are the individual, group and organisational levels as well as the local level. By taking these levels into consideration, we aim to detect the teacher competence characteristic to UDL teaching. Furthermore, we will parallel UDL teaching with inclusive pedagogies in detecting the dimensions of teacher competence (cf. Jimenez & Hudson, 2019).

10.3   The Collaborative Action Research Rationale

Our research is a practice-oriented longitudinal case study (Yin, 2014), where two teachers – a class teacher and a special education teacher – teaching the same group as co-teachers, and their colleague, a class teacher with her class, implemented the UDL approach in their heterogeneous classes. The research strategy can be characterised as collaborative action research, whose ontological starting point is the people's socially constructed knowledge (Brydon-Miller et al., 2003). This action research comprises a range of data collecting methods and data, like observations, interviews, mentoring discussions and surveys.

In *the orientation cycle*, during the academic year 2017–2018, the researchers collected research data about the pupils and the co-teachers in the research class. The co-teachers' pedagogical practices were observed and identified in theoretical frames. Then, during the autumn semester of 2018, the co-teachers were trained to understand the principles of UDL. During January and February of 2019, the teachers developed and trialled UDL periods in their classroom. The researchers collected data from the pilots and had mentoring discussions with the researchers. The final outcome from the first cycle was to sketch the next action research cycle based on the analysis of the UDL trials.

In *the second cycle*, the co-teachers applied UDL as thematic periods with their pupils. In order to get more feedback from their teaching with UDL, the co-teachers and researchers decided to invite a class of first-graders and their teacher to join the UDL teaching periods in the autumn term of 2019. The second action research cycle generated the actual data for the final conceptualisation of teacher competence needed while implementing UDL in teaching.

The *third cycle* took place in the spring term of 2020, when the researchers distanced themselves from the actual field of teaching and started to analyse the data in the theoretical frames (Yin, 2014) of teacher competence. The analysis of the teachers' development and implementation of UDL in the research classes was carried out utilising the MAP model. These conceptualisations are introduced at the end of each subsection of an UDL principle.

The research took place in the North of Finland which is a sparsely populated area. The demographic structure of the region sets challenges for schools. The support services, for example, the central hospital, is situated in the nearest town, over 100 km away. Consequently, the teachers and the local authorities need to be innovative and collaborate in order to organise the support for the students as effectively as possible. In addition, the school is situated in the Sámi region, in Finnish Lapland, where the only indigenous people in Finland live. This means that teaching needs to be culturally sensitive and encourage all children to respect their own and other students' roots. The research classes were heterogeneous in that they have pupils with diverse needs, including pupils with special educational needs. The action research started in autumn 2017 in one class of first-graders (7-year-olds). In the class, there were two teachers starting their collaboration, a class teacher and a special education teacher, who taught as co-teachers. In Finnish schools, there are

teaching assistants (TA:s) who support teachers' work as the teachers act as pedagogical leaders in their classes. The TA:s may support the whole class or they may be appointed as personal assistants for certain students with SEN. In the research class, there were two TA:s for the whole group, and two TA:s as personal assistants for certain pupils.

In Finnish comprehensive school, there is a three-tiered support system for learning which gives flexible conditions for organising the educational support for students in mainstream settings. The tier of special needs is the third and strongest form of support for learning in Finnish compulsory education, requiring a formal administrative decision and an expert's report after being processed in a multi-professional student welfare group and parents (FNAE, 2016). The second tier of support, which is referred to as intensified support, is meant for pupils who have mild difficulties in their studies or who are at risk of marginalising. The decision on this tier needs to be agreed in a multi-professional student welfare group together with parents (FNAE, 2016). The general support is meant for all pupils (FNAE, 2016).

During academic year 2017–2018, there were 17 pupils, of which 8 had a decision of special needs support (SEN) and an individual education plan (IEP). Four of the pupils with SEN were in extended compulsory education, of which one pupil's IEP was arranged by activity areas. One pupil of the class was in the tier of intensified support. There were nine pupils in the class on the tier of general support. During the research years, some changes occurred while some support decisions moved up or down the support tiers and some pupils moved away or new ones entered the class. On the second grade, there were 18 pupils and on the third grade, there were 20 pupils in the class.

During the second cycle of action research, for the actual UDL periods in autumn 2019, the co-teachers invited a partner class. The purpose was to obtain more feedback and disseminate the knowledge on UDL. In the partner class, there were 20 first-graders, one class teacher and one TA. One of the pupils was in the tier of intensified support and two were non-Finnish-speaking pupils. So altogether, for the UDL periods in autumn 2019, there were three teachers, three TA:s for the whole group, two personal TA:s and 40 pupils.

The research agreement was made with the municipal school government, the school principal and the teachers. The researchers and the teachers carefully informed the TA:s, pupils and their parents of what was going on in their classes. The TA:s, the parents and pupils were given an informed consent, which included relevant information about the research goals and the ways of publication as well as the possibility to withdraw from the research whenever they wanted (Cohen et al., 2011). In the research results, pupils were given pseudonym names and the adults were called by their position as co-teachers, first class teacher and TA:s.

10.4   The Finnish Case – UDL Principles in Terms of Teacher Competence

Although the UDL framework is, overall, an entity, we will introduce our results by viewing each UDL principle one at a time. First, we will explore the teachers' pedagogical practices and their development during the teaching processes. Through the exploration, we will detect the situation-specific skills needed in the chosen pedagogical practices. In addition, we will analyse the pupils' perceptions of their own learning before and after the UDL lessons, and investigate the changes that appeared in the pupils' learning experiences and motivation. Finally, we will interpret the connection with the teacher skills found in our research and the expected teacher competence according the MAP model, reflecting on them in accordance with previous research. The procedure of our research is illustrated in Fig. 10.2.

In the following subsections, the teachers' development and skills are described according to the first and second cycles of our action research. The third cycle of our action research becomes visible at the end of each subsection, when we conceptualise the connection with the skills and the expected teacher competence according the MAP model.

The Co-teachers Create a Safe and Motivating Learning Environment

We will start our examination by scrutinising the co-teachers' pedagogical practices that are linked to the UDL principle called *the multiple means of engagement*. This principle deals with the 'why of learning', in other words, it describes the means to enhance students' motivation towards and engagement in their studies.

The autumn semester in 2017 was well under way when we visited the co-teachers' research class for the first time. The first-graders were not very far in their
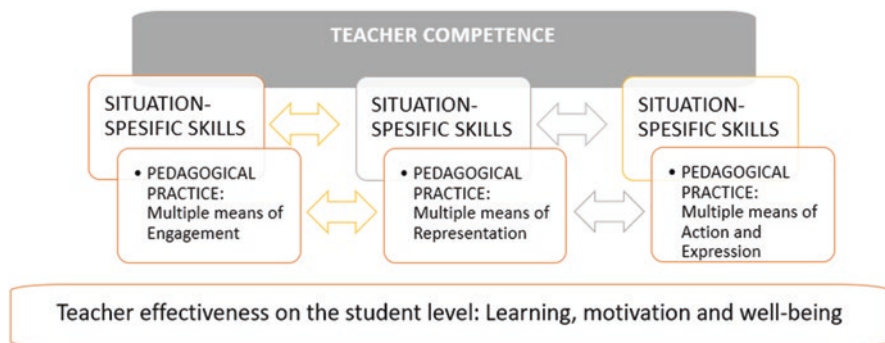

Fig. 10.2 Research procedure in the frames of the MAP model of teacher competence

academic studies; they had only learnt a couple of letters and numbers so far. What caught our attention, however, was the tranquillity in the pupils, co-teachers and TA:s' actions. Various work methods were used during the lessons, but the pupils always seemed to know what to do. At times, they consulted one another about an assignment or discussed it with the teacher or teaching assistant, but the atmosphere in the class remained peaceful and comfortable. The co-teachers told us that the main goal of the autumn semester was to teach the pupils how to study and work together (Observation and mentoring discussion, 12 Oct 2017).

In the spring 2017, after having permission from the school's administration for the joint class of special needs children and children on the tier of general support, the co-teachers had started planning their work. From the very beginning, the co-teachers invested in engaging the parents in their work. As early as the second school day evening, they invited the parents and carers to a parents' meeting and explained the principles behind their teaching. Their goal was to teach diverse children to study together according to their own potential and to bring up the pupils as tolerant persons. The co-teachers stressed the importance of appreciating the parents' opinions and knowledge. During parents' meetings, they asked the parents to generate ideas for trips and asked them about various volunteer tasks. They also invited parents to visit the class and asked that the visitor describe his/her own work, such as reindeer herding, which is an important livelihood in the region.

Some of the fathers [during the parents' meeting] were like: 'Wow!' The parents asked: 'When will this happiness end?' (Co-teachers in mentoring discussion, 12 Oct 2017)

For example, when we had an excursion to the woods, one of the fathers, a reindeer herder, came to talk about the eight seasons in which the reindeer herding affairs are set. (Co-teachers in mentoring discussion, 22 Nov 2018)

The co-teachers took basic guidelines from the seven cross-curricular skills mentioned in the Finnish core curriculum (FNAE, 2016), especially the skill referred to as *thinking and learning to learn.* The aim there is that pupils learn to observe and search, evaluate, modify, produce and share information and ideas as well as reflect on themselves as learners and interact with their environment (FNAE, 2016).

The point is there are the cross-curricular skills and inside them the single school subjects. For example, the meaning of pupils' meta-cognitive skills, how they are expected to learn how to assess their learning. After all, that is the most important thing, to learn to see yourself as a learner, to see your own strengths. (Co-teachers in mentoring discussion, 12 Oct 2017)

At the beginning of the first semester, the co-teachers noticed that many of their pupils, especially those with difficulties in learning or concentration, had a low self-esteem. This notion led them to apply positive pedagogies in which the co-teachers focused on pupils' strengths, supported them in growing persistence and giving them experiences of success.

We have tried to apply a positive [pedagogy]. It means that we constantly work to support these children. Their self-esteem is extremely weak. They almost every time say that 'I'm bad', I can't', 'I'm good for nothing'. (Co-teachers in mentoring discussion, 12 Oct 2017)

All the adults in the research class had a child-centred and positive way of thinking. They believed in the pupils and their opportunities to learn despite learning and other difficulties. Actually, they rather saw difficulties in the teaching than in the learning. That is why they continuously monitored their pupils' learning processes. They also tried to give positive feedback as much as possible.

> *Co-teacher: Perhaps the most important thing, I think, is what we have decided: that we believe that a child will learn.* (Co-teachers in mentoring discussion, 8 Nov 2019)
>
> *'The pupils with SEN couldn't start working on their own. […] Two lessons were too short a time for SEN pupils. The special needs teacher and the teaching assistant noticed these challenges and set out to think about the learning package more next time from the perspective of SEN pupils.* (Co-teacher's notes, 17 Jan 2019)

The co-teachers introduced the pupils to the story of Winnie the Pooh and used the characters of the story when the pupils learned self-assessment (see Picture 10.1). The aim was to systematically develop the pupils' metacognitive skills in a way that corresponded to the pupil's cognitive level. The children could relate to the various characters according their feeling after having accomplished their learning task. Furthermore, the identification of the learning process was enhanced when the pupils were able to hear each other's evaluations.

> *The pupils sit in the circle. On the table, each soft toy represents a character from the Winnie the Pooh stories. Each toy also has an emoji that matches the toy's character. Self-evaluation begins: the pupils pin their own wooden clothes peg with their name on it to a toy figure that corresponds to their sensations of doing in the previous school task. Then each pupil presents reasons for their solutions. For example, Anna is frustrated because during the [previous] exercise, she twice accidently picked up the same word for the worksheet. Her assessment is analysed appropriately as a whole.* (Observation, 15 Jan 2018)

The co-teachers taught their pupils' social skills and paid attention to the positive internal social relationships in the group. They took advantage of pupils' real decision-making situations and had profound discussions with their pupils. Overall,

Picture 10.1 The toy characters facilitating the pupils' self-assessment

the co-teachers had made a conscious decision that their first priority was to proceed peacefully and, above all, teach their pupils how to study.

> *During the break, the pupils pretended to be a reindeer herd. They had a problem of who got to be the lead reindeer. If there are many of them, the herd will fall apart, the children said. The co-teacher asked what kinds of suggestions the pupils have for solving the problem. They discussed different options. Eventually they decided they all can be the lead reindeer on their own turn.* (Observation, 22 Nov 2018)

Two examples of the girl who came to the class the second year, show that the pupils' internal relationships were strong and that the co-teachers had managed to teach the pupils social skills and a sense of togetherness.

> *At the beginning, Nina had difficulties and challenges. She could have tantrum, lie on the floor and kick. But the other pupils did not become disturbed at all. One time I was at the front teaching. The pupils were sitting in a row on the benches. Nina was yelling very loudly at the back of the classroom. No one turned their heads, they just concentrated on my teaching.* (Co-teachers in mentoring discussion, 22 Nov 2018)

In the previous situation, the pupils knew that the special needs assistant would handle Nina's tantrum. They were discreet and pretended to notice nothing. Another example shows that the pupils felt empathy for the new girl and wanted her to feel comfortable in the class:

> *It was like a diamond moment when Nina went to strike and did not want to take a nap [Nina had to rest during the school day during the first months at school]. The teacher and the personal assistant could not make her agree to go to sleep. Then a boy with many difficulties in behaviour himself stood up, went to take Nina by the hand and said: 'Come now Nina, now you will have a nap'. And the girl followed him nicely to the rest room.* (Co-teachers in mentoring discussion, 22 Nov 2018)

We will now look at the teacher's effectiveness on the student level. According to MAP model, it can be demonstrated through the students' learning, motivation and well-being (Metsäpelto et al., 2020). We used a research-based Finnish survey, called 'I as a schoolchild' (Aro et al., 2014). We carried out the survey at the beginning of the first grade's spring semester (15 Jan 2018) and at the end of the second year's spring semester in 2019 (7 May 2019). We interviewed the children individually because not all of them could read at that point. The pupils answered the propositions by assessing them via a Likert scale. We used emojis ranging from a smiley face (I agree) to a sad face (disagree) to support the verbal instructions. For the assessment of the pupils' engagement in school, we selected three items from the survey. The pupils' experiences were already quite positive during the first grade, but at the end of the second grade, they were even more positive. However, in 2018 there were two pupils with SEN whose feelings were quite negative. Their answers showed that they did not enjoy going to school, their class or the school as a whole. The answers concerning the pupils' enjoyment of school are illustrated in Table 10.1.

During the pupils' second school year, in spring semester of 2019, we mapped the internal peer relationships in the class. The sociograms with the question asked are demonstrated in Figs. 10.3 and 10.4. The sociograms are divided into zones which describe how many mentions each pupil got. The pupils with SEN, intensified

**Table 10.1** Co-teachers' pupils' answers on how they enjoy going to school

Item	Year	Agree	Sometimes agree	Disagree	Σ
I like going to school	2018	81.3% (13)	12.5% (12)	6.3 (1)	100.0% (16)
	2019	85.7% (12)	14.3% (2)	–	100.0% (14)
I enjoy my class	2018	87.5% (14)	–	12.5% (2)	100.0% (16)
	2019	100.0% (14)	–	–	100.0% (14)
We have a nice school	2018	81.3% (13)	5.3% (1)	10.5% (2)	100.0% (16)
	2019	92.9% (13)	7.1% (1)	–	100.0% (14)
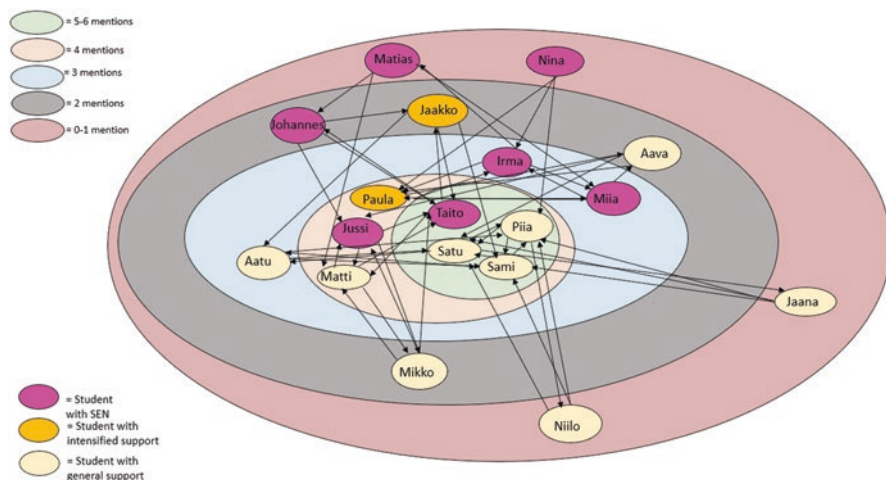
Fig. 10.3 Co-teachers' class, sociogram answering the question: In our class we study by doing group work. Which three classmates will you choose for your group?

and general support are coloured different colour. At first, the pupils were instructed to imagine they were studying by doing teamwork, and they were asked to name three classmates with whom they would prefer to study. All the pupils, except Nina, was named at least once (Fig. 10.3). However, the result of the sociograms can be regarded as good because there are mentions between pupils with different tiers of support, and most every pupil received mentions. The reason why Nina did not get any mentions was probably due to her severe learning difficulties. Her most important goals at school were learning to follow the teachers' instructions, such as to sit in one place for a few minutes, to listen to a story or to take care of her needs in going to the toilet. She was also learning to express herself through some short words.

The second question addressed to the pupils was 'With whom would you not like to play during the break?' (Fig. 10.4). The results show that Johannes (eight mentions), a boy with ADHD, was the least-wanted playmate. This result can be explained by his behavioural symptoms that may cause conflicts while playing. The second least-wanted play mate was Irma (three mentions), who was a pupil with
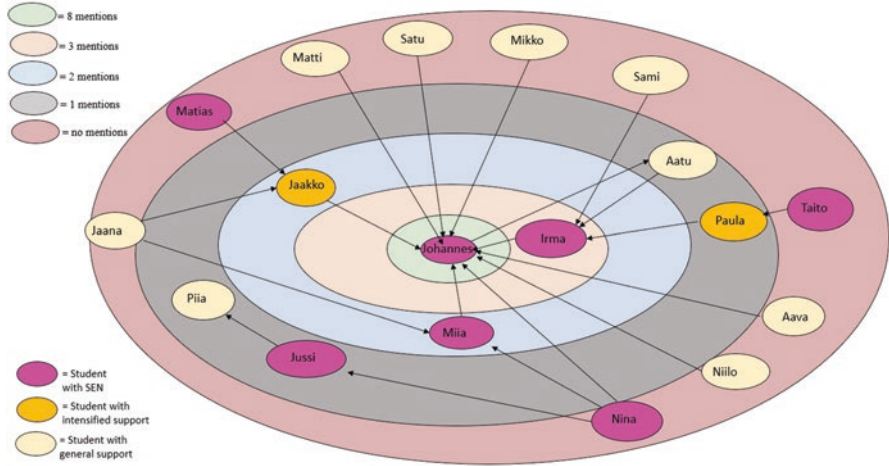
Fig. 10.4 Co-teachers' class, sociogram answering the question: With whom would you not like to play during the break?

SEN, too. Otherwise there were only one or two mentions for certain pupils, and they were pupils with all three tiers of support.

The difference between the two sociograms shows that at school there are various social arenas in which pupils are included at diverse levels (cf. Qvortrup & Qvortrup, 2018). In the light of the survey and sociograms, the atmosphere in the class appeared generally good but still with some problems.

In the following section, we will conceptualise the co-teachers' pedagogical practices in light of the previous literature to see what kind of teacher competence is needed while building the class community and engaging the pupils in their studies.

Teacher Competence and Multiple Means of Engagement In summary, the analysis of the co-teachers' pedagogical practices shows that even before the introduction of the UDL approach, the co-teachers used the same kinds of pedagogical solutions as used in the UDL approach in regard to its principle of multiple means of engagement. The pedagogies resonate with previous research on inclusive education, too.

In the MAP model, the competence needed here is placed in the dimension of non-cognitive competence, especially a teacher's *social and communication skills* and *personal orientations* (Metsäpelto et al., 2020). They contain five sub-categories of *relational skills, emotional competence, diversity competence, intercultural competence and interaction*. They all fit in the pedagogical profile of the co-teachers in our study. To begin with, the co-teachers were very sensitive to the pupils' needs and engaged in supporting their pupils (see e.g. Tjernberg & Mattson, 2014). The co-teachers listened to their pupils and strengthened their sense of belonging which is considered an essential feature in inclusive education (Qvortrup & Qvortrup, 2018) and an element that contributes to students' well-being and learning (Burke & Claughton, 2019). As skills, these pedagogical actions can be interpreted as teacher

commitment and sense of responsibility to their students (see e.g. Shani & Hebel, 2016). In turn, the competencies that underlie these skills are the teacher's personal values, attitudes, beliefs and experiences (e.g. Levin & He, 2008).

From the MAP model's personal orientations, we include here the teachers' *personal dispositions*, such as *general patterns of adaptation*, as well as *self-conceptions* constructed by *one's beliefs, values, ethics and teacher's motivational orientation*. These aspects initiated the teachers to give emotional support for their students (Lakkala et al., 2020) – instead of being distant and information oriented, seeing him−/herself as a transmitter of academic knowledge (cf. Hargreaves, 2000). According to inspections reported in the literature, a teacher's emotional support predicts a broad range of social and task-oriented competencies of students (Hamre & Pianta, 2005).

In the MAP model, the teachers' *cognitive thinking skills* resonate with the pedagogical actions promoting students' metacognitive skills. They tell about the co-teachers' abilities to reflect on their teaching and adjust it according to their pupils' needs (Lingard & Mills, 2007). This dimension consists of five sub-dimensions of teachers' ability for *information processing, critical thinking and problem-solving, creativity, communication, argumentation and reasoning and metacognition*. The co-teachers followed the UDL principle of multiple means of engagement when they taught their pupils self-assessment in ways that matched their cognitive development to enhance their self-understanding and metacognitive skills (Elder, 2010). By teaching their students abilities to progress in their studies, the teachers also prevented social inequality (cf. Lingard & Mills, 2007). When doing so, they accentuated their pupils' transformation as learners, a feature linked to inclusive pedagogies as well (Florian & Spratt, 2013). Furthermore, by applying informational and encouraging feedback (Ryan & Deci, 2016), they enabled the interaction between the curriculum and the learner (Rose, 2014), which is one of the essential ideas of the UDL approach.

One aspect in the co-teachers' pedagogy, which is not clearly explicated in the UDL approach, was collaboration with parents and carers. In contrast, this aspect is well illustrated in inclusive pedagogy. For example, in a well-known international project called Teacher Education for Inclusion, the ability to collaborate was identified as a crucial inclusive teacher's skill (Watkins & Donnelly, 2012). In our case, the co-teachers invested in good relationships with the parents and carers as well as reciprocal co-operation.

As a conclusion, from the developmental point of view, the co-teachers were already competent to implement the first UDL principle. The only developmental aspect that could be detected was that through our mentoring discussions, the essential features of this UDL principle and its connections to other conceptual frameworks became clearer to both the co-teachers and researchers. Next, we will continue our analysis with the second UDL principle – multiple means of representation – and examine the teachers' pedagogical actions related to this UDL principle.

The Teachers' Develop Their Pedagogical Practices

The UDL principle called *multiple means of representation* in our research deals with the 'what of learning', describing the means to reduce students' learning barriers to perceive information (Rose et al., 2014). It is the teachers' responsibility to find the most appropriate ways to access the contents of learning.

In part, the next results describe the co-teachers' pedagogical actions in their own class when they were studying the UDL approach and trialling it with their pupils (spring term 2019). Partly, the data excerpts date from the period when the co-teachers invited a class of first-graders, their teacher and one teaching assistant to join their UDL teaching (in November 2019).

Sometimes the co-teachers used embedded instruction, which means they utilised natural opportunities during the school day to teach a skill or to enhance a pupil's self-efficacy, social skills and tolerance (see e.g. Kurth & Gross, 2015). For example, during the story telling sessions, when the pupils rehearsed oral comprehension, the teachers assured that everyone got experiences of success by planning in advance what questions were addressed to the two pupils who had severe learning difficulties or used a communicator in their communication (Observation, 15 Jan 2018). Another example describes the ways that the co-teachers enabled a pupil with attention deficit to access the information taught.

> *The children sit on a row of benches, and the teacher begins to read a story. Everyone listens, except that Johannes moves about in his seat. Johannes whispers something to the teaching assistant. The assistant nods, and Johannes goes and fetches a colouring picture and pencils. He returns to his seat, listens to the story and draws while listening.* (Observation, 15 Jan 2018)

Mostly in the co-teachers' class, especially during reading or math lessons, the pupils worked in groups, named after colours, in order to get timely and targeted support for their learning needs. Many times, the teachers divided the pupils into three groups with various exercises (see Picture 10.2). These tasks were variations on the same theme. The tasks were tailored according to the pupils' learning profiles.

The co-teachers also used other kinds of groupings, such as station working, where the children either played a game or did math exercises or functional tasks. The co-teachers' goal was to strengthen their pupils' self-efficacy by providing them tasks in which they could succeed. As one of the co-teachers said:

> *Scale, fit, differentiate. Everything you do, make it the size of the child, so that he/she can experience success. And if she/he fails in the task, the pupil should feel that 'Hey, we got over this problem together!'* (Co-teachers in mentoring discussion, 22 Nov 2018)

The co-teachers started trialling UDL in their class in spring term 2019. Their theme was the human body and its functions. They used the flexible groupings for targeted support (blue, green and red groups). The first trial showed that the green group of pupils with SEN had trouble understanding the instructions and learning tasks. For the next UDL trials, the co-teachers developed the learning tasks to be more accessible to the whole group. The pupils had mutual starting and ending

Picture 10.2 Instruction
for flexible grouping
during math and reading
lessons for the blue, green
and red groups,
co-teachers' class
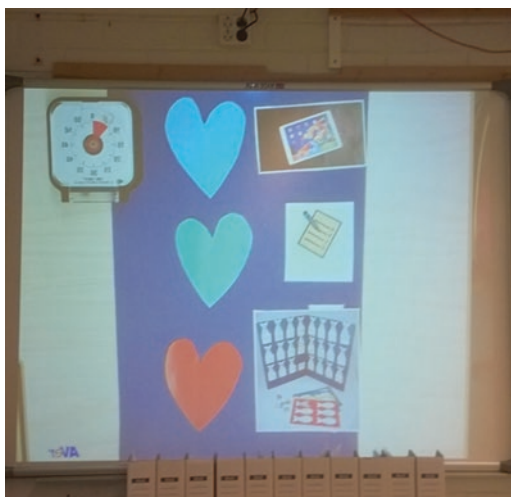
points for the lessons, for example, the pupils watched parts of the series 'Once upon a time… the life' animation film (Co-teacher's notes, 31 Jan 2019). They planned more concrete learning material for all. Still, they continued to prepare tailored material, too, because of the severe learning difficulties of the pupils with SEN. In addition, during the lessons, the co-teachers and the TA:s guided the groups carefully. They also gave more time for the pupils' learning.

> We had a mutual start where we looked at the pupils' baby photos [that they had brought from home]. Lovely moment! We discussed a lot. Then we had the working session in small groups. All the groups had tailored exercises about the same topic. The green group [pupils with SEN] started following the pattern well proven by using the easy-to-read text tailored for them. The other two groups studied the topic autonomously from the books. After the various exercises, we watched an animation film about human functions. (Co-teacher's notes, 31 Jan 2019)

The co-teachers continued further developing the UDL trials. They started giving the pupils options for the learning tasks while the topic was the same. The options enabled their pupils to choose the way to study in which they learned best. The instructions were given both verbally and pictorially (see Picture 10.3).

After the UDL trials in their own class, the co-teachers carried out two actual UDL periods. They invited a class of first-graders, their teacher and their teaching assistant to join the periods. In November 2019, they started with the topic of Lappish animals. At the beginning of the UDL session, the pupils were given instructions through verbal and visual explanations, and they were divided to small heterogeneous groups. Each small group had at least one pupil following the tier of general support, a third-grader, one pupil following the tier of intensified support or a pupil with SEN (a third-grader), and one first-grader. Because there were pupils of various abilities and ages, they could choose different ways of producing the knowledge/outcome about the mutual topic.

Picture 10.3 The options for the learning tasks for the lesson, pictorial instruction and co-teachers' class

> *The pupils are divided into heterogeneous small groups (first- and third-graders). One of the teachers explains and shows how to work with the day's topic. The pupils can search information on an iPad (animal document films) or in a book. The younger ones or the children who cannot read can listen when the pupils who are literate read aloud. They can make notes, sculpt playdough or draw (the Lappish animal they are studying).* (Observation, co-teachers' class and first graders, 8 Nov 2019)

During the second UDL period, the teachers continued to reflect on their teaching and the pupils' learning. In spite of some groups needing strong guidance, the adults tried to give space for their pupils' autonomous choices. The pupils were creating animal tales in the same kind of mixed-aged small groups as before.

> *The small group of Miia, Jussi, Irma and Matias needed much guidance on how to study together. Even coming up with the mutual topic for today's task (the task was to come up with a mutual tale) was difficult. Strong guidance by an adult was needed. Some of the children will need lots of guidance for learning to collaborate. – As in teacher's role, I felt it challenging not to guide the children much in direction of my vision but tried to let the children's views show.* (Co-teacher's and first grade teacher's notes, 22 Nov 2019)

After the pupils had invented a topic for the tale, they were introduced to the concept of the mind map. With the help of the mind map, they created the plot of the tale (see Fig. 10.5).

Figure 10.5 shows that the teachers highlighted patterns and critical features when the pupils were composing the tales. The mind map helped them to learn the anchor concepts and basic structure of a tale. The pupils of the group could participate in the story telling from their own starting points, some verbally, some by drawing and some by writing (Co-teacher's and first grade teacher's notes, 22 Nov 2019).

We examined the pupils' experiences of the representation of learning contents in the co-teachers' class through the 'I as a schoolchild' survey (Aro et al., 2014) twice. The pupils were asked if there are enjoyable tasks at school; whether they do the difficult tasks, too and whether they finish the tasks. The pupils (year 2018 – $N = 15$, year 2019 – $N = 14$) answered the statements by assessing them on a Likert scale. The results are shown in Fig. 10.6.
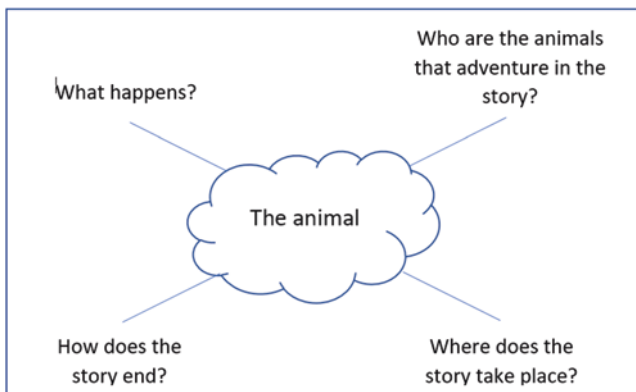
Fig. 10.5 The mind map of the tale presented for the co-teacher's and first grade teacher's pupils
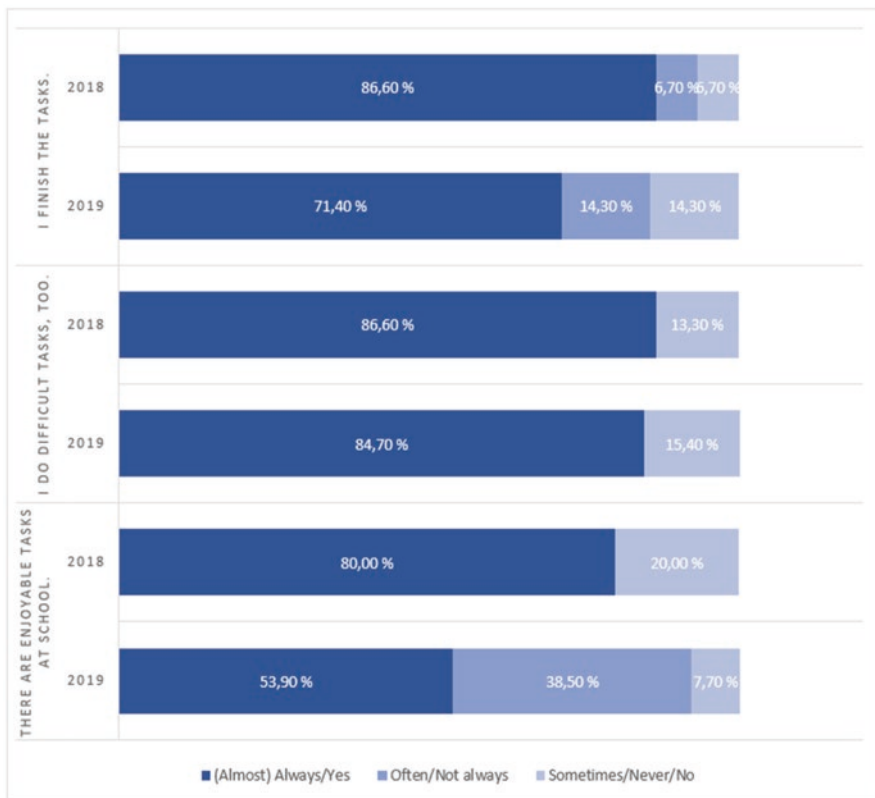

Fig. 10.6 Co-teachers' pupils' answers on how they feel about the school tasks

In both years, over half of the pupils answered all the statements in a very positive way. However, the number of pupils with a very positive attitude towards the enjoyable tasks at school reduced during the second grade. When asking if the pupils finish the tasks, the number of strongly negative answers increased slightly in the second grade. For the question on whether the pupil also does difficult tasks, two pupils answered that they do them only sometimes or never, in both year's surveys. Both were pupils with SEN. Otherwise, all the most negative answers on all three questions were given by the same SEN pupils in both years. According to the co-teachers, these pupils did not have high esteem in regard to schooling. However, we may anticipate that their self-esteem is low partly because of inappropriate tasks.

After the UDL lessons, the pupils from grades 1 and 3 ($N = 37$) answered a survey through which they assessed their own working during the UDL lessons. For assessment, we constructed a questionnaire called '*This is what I am as a learner*' based on the UDL principles (Appendix 10.1). Three of the items were interlinked to the multiple means of representation, and their results are illustrated in Fig. 10.7. When analysing, we combined the original five categories into three categories of answers of 1 – agree or almost agree, 2 – I don't know and 3 – fairly disagree or disagree.

In Fig. 10.7, we can see that pupils' experiences with the UDL lessons were mainly very positive. However, there were also pupils whose experiences of the UDL lessons were not so positive. There were three to five pupils who answered that they had not learned, had not understood the things to be learned or had experienced the lessons as boring. We analysed the connection between the different pupils' answers with the Pearson's correlation test (Rodgers & Nicewander, 1988). We found no statistically significant differences between the answers and the pupils' support levels: there were pupils studying in every level of the three-tiered support (general, intensified and special support) who answered both positively and
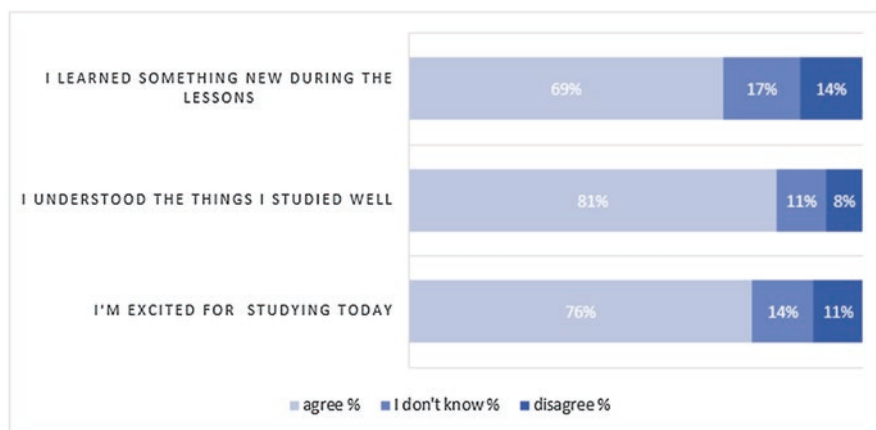
Fig. 10.7 Co-teachers' and first grade pupils' self-assessment of their learning after the UDL lessons

negatively (see Table 10.2 in Appendix 10.2). Furthermore, there were no statistically significant differences as to whether a pupil was a first- or third-grader. Instead, we found a slight positive correlation between how excited a pupil was and how well she/he understood the things to be learned ($r = 0.356*$, $p = 0.033$). We assume that the positive correlation indicates the relevance of motivation.

Teacher Competence and Multiple Means of Representation In the MAP model, the implementation of the multiple ways of representation corresponds with the teacher competence called *knowledge base for teaching and learning.* The crucial sub-dimensions of this teacher competence are especially *content knowledge, pedagogical knowledge and pedagogical content knowledge*. This knowledge combines teachers' formal and experiential knowledge, built on their previous experiences and actions in classrooms, and on their reflections on those experiences (van Driel et al., 2001).

According to our findings, the teachers created a learning environment and atmosphere that encouraged the pupils and supported their learning. They did not use any study books; rather, their teaching was based on the curriculum, which they carefully amended and implemented (see also Lakkala & Määttä, 2011). The teachers used self-made authentic tasks in a meaningful context. They reflected on the teaching both individually and collectively, and through that they succeeded in assessing their own actions as a teacher and in developing pupils' learning processes. They considered the pupils' previous knowledge about the subject to be learned, and they used various materials, tasks and contents depending on pupils' needs and readiness. During the UDL trials, the co-teachers realised that instead of tailoring all the learning tasks, the pupils learn to utilise their learning capacity if they are also given optional ways for learning. This, in turn, promotes the development of the pupils' thinking and learning to learn.

Furthermore, the UDL principle of multiple ways of representation is interlinked with the teacher competence called *cognitive thinking skills* of the MAP model. When changing their teaching strategy, the teachers showed abilities to critically analyse, evaluate, reorganise, create and expand knowledge and to find new ways to solve problems to achieve a goal (see also Krathwohl, 2002). In the MAP model, this competence contains five sub-dimensions, which are *information processing, critical thinking and problem-solving, creativity, communication including argumentation and reasoning, and metacognition*. The teachers were very precise with their verbalisation in order to make the learning contents accessible for their pupils. They used open-ended questions, repetitions and rich language in learning situations. Also, Pianta et al. (2008) recognise the significance of instructional support on the learning process.

As a developmental consequence, teachers managed to change their teaching methods from tailored tasks to new ways of teaching. Using UDL in the research classes encouraged pupils to have confidence in themselves and their views. When instructing the pupils in small groups, the teachers gave space to pupils' questions and inspired them to search for answers, listen to others' views and also reflect on their previous knowledge. The teachers gave plenty of feedback, challenging the

pupils to think and ponder as well as encouraging peer feedback (cf. Hamre et al., 2013). In Pakarinen et al.'s (2010) research, they proved that high-quality instructional support increased students' task-oriented learning in the classroom. The teachers' skills of communication and argumentation resonate with higher-order thinking skills, and they are considered critical for teachers' work (Metsäpelto et al., 2020).

To summarise, we noticed differences between co-teachers' practices and the guidelines of UDL. In the UDL guidelines, mixed-ability groups are emphasised when talking about learner variability (see e.g. Ralabate, 2016). Also, in inclusive teaching methods, student grouping may be used with mixed-ability groups (Kurth & Gross, 2015). In our research, in spite of implementing UDL in mixed groups, the co-teachers also continued to use tailored tasks, and therefore the pupils with different abilities sometimes worked in their own small groups. Then the co-teachers used scaffolding, which enabled the pupils to work in their own proximal zone of learning (Vygotsky, 1978). Flexible grouping was defined by the co-teachers as grouping that is not static (cf. Radencich & McKay, 1995). By grouping and using different teaching techniques, tasks and support with different groups, the co-teachers strived to create an optimal learning environment for the heterogeneous group (Ford, 2005).

Although tailored tasks for targeted pupils are viewed positively in many studies, there is a chance that pupils may feel stigmatised when they are placed to certain groups and when they themselves realise the reason (e.g. developmental, emotional or behavioural problems). Alternatively, the stigma associated with identification as needing special treatment can be reduced by talking understandably about differences, accepting the differences as a natural part of being human and what differences mean for students' education, and emphasising the benefits of differentiation (see e.g. Kaufman & Badar, 2013).

Next, we will carry on with our inquiry and examine the pedagogical actions and teacher competence related to the third UDL principle, called multiple means of action and expression.

The Teachers Enable Their Pupils' Actions by Managing Their Teaching Through Multi-professional Team

The third principle of the UDL model is called *multiple means of action and expression*. This principle deals with 'the how of learning' and focuses on providing options for physical action, expression and communication and executive functions. The goal is to support all students to becoming strategic and goal-directed learners (Rose et al., 2014), which is a principle of inclusive pedagogy, too (Florian & Spratt, 2013). When accessing the learning process, the teacher utilises various ways, materials and techniques of communication and expression. When internalising, building one's own knowledge, the students must be conscious of the meanings of goal setting, planning, choosing of strategy and monitoring the whole learning process (CAST, 2018).

In terms of supporting all the pupils, it was significant that there were several adults in the classroom. It was easier to utilise various ways, materials and techniques of communication and expression when there were many instructors in the class. Some pupils, for example, had difficulties in starting to work, and then a teacher or an assistant could help the pupil and direct him/her forward immediately (Observation, 8 Nov 2019).

Every week the co-teachers wrote a plan for the week into a folder, where the TA:s could see them, too. The plan included weekly learning tasks in different subjects as well as the pupils' therapies or visits to the doctor, for example. The division of work between the adults in the class was clear, and the TA:s felt that their skills were respected, as one of the TA:s pondered:

> What matters to me is our team. We work together and flexibly hop into the other's shoes, if needed. – And especially we all can use our own strengths: where someone is good at, she can take care of it. I think the other [assistants of the school] are jealous while we have a chance to work in this class. (TA in mentoring discussion, 12 Oct 2017)

The co-teachers, the TA:s formed a strong multi-professional community each with their own knowledge and skills. The co-teachers and TA:s had both systematic and spontaneous discussions in which they communicated and shared their ideas, skills and knowledge (Observation, co-teachers' class, 12 Oct 2017).

The co-teachers followed the curriculum but used no study books. All the pupils got their own portfolios, which were built gradually when different learning tasks were accomplished. Six times during the school year, they received a new portfolio. Some examples of the portfolios and exercises are shown in Pictures 10.4, 10.5 and 10.6. Within each portfolio, the co-teachers enclosed a short evaluation of the pupil's progress in learning. The parents also wrote their evaluation of their child's learning from the home aspect in the portfolios.

During lessons, the co-teachers created and allowed for various ways of practising and learning. Their planning of the learning situations was based on the knowledge of their pupils, as the following examples show. The teachers were aware of

Pictures 10.4, 10.5 and 10.6 Co-teachers' pupil's own portfolio and exercises

the children's common psychological development process and the usual difficulties in it, so they could implement theory into practice and see the possible challenges during school days. They also allowed the pupils to decide on the task or the way of practising by themselves. The pupils watched videos, read, discussed, modelled and drew and then introduced the outcomes to the others (Observation, 8 Nov 2019).

> *Everyone had the opportunity to bring out what they learned in their group's presentation [UDL period, Lappish animals] in a way that was pleasing to him/her and felt most comfortable. The opportunity to present in peace was also given to those whose output was slower than others, for example in reading and moving. The [talented] pupils are enabled to go at their own pace while giving the others precise instructions.* (Observation, co-teacher's and first grade teacher's pupils, 8 Nov 2019)

After starting to apply UDL, the pupils were allowed to construct their own learning situations. It was challenging for some, and they sometimes made decisions based on reasons other than their own competence, such as they just followed their schoolmates. In that case, they perhaps had difficulties in completing the task alone, and the adults guided those pupils towards appropriate tasks. The teachers thought that if the pupils' executive functions are still at a low level, the pupil needs more guidance.

> *The co-teacher 1 (special needs teacher) and the teaching assistant, having become wiser from the previous lesson, adapted the assignments and the subject to be taught to be more suitable for the special needs pupils. This time the topic was presented with more help from the teacher.* (Co-teacher's and first grade teacher's notes, 24 Jan 2019)

They were either taught by scaffolding lower-level skills so that the pupils required less executive processing or by scaffolding higher-level executive skills and strategies. In addition to the meta-cognitive skills, the co-teachers also tried to promote the pupils' social skills and skills in group work.

> *Co-teacher 1: The pupils with SEN wanted to work in pairs, too, but they did not know how. The kids didn't understand what it means to work together, and it became an obstacle to learning. Recently, we have been practising working in pairs […]*
> *Co-teacher 2: Yeah, the pair work kind of works, but if we have a task that includes talking, there are a few really clever pupils who can easily dominate others. […] This is a skill that needs to be developed, that everyone listens to each other.* (Co-teachers in mentoring discussion, 7 May 2019)

For the analysis of the pupils' experiences, the co-teachers' pupils answered a survey (Aro et al. 2014) where they were asked to assess if they get help when needed, if they are encouraged and if the teachers are just/fair to them. The pupils (year 2018 – $N = 15$, year 2019 – $N = 14$) answered the propositions by assessing them with a Likert scale, which we reduced from 5 to 3. The answers show that in 2018, most of the pupils felt that they got the support they needed. In 2019, the situation was even better. All the co-teachers' pupils answered that they got help always or often when asking for it. Furthermore, the number of the most negative answers was decreased in all three statements from 2018 to 2019. The answers are illustrated in Table 10.3.

Table 10.3 Co-teachers pupils' answers about whether they get help, encouragement and fairness in their class

Statement	Year	Always/often	Sometimes	Very seldom/never	Σ
I get help if I ask for it.	2018	80.0% (12)	13.3 (2)	6.7% (1)	100.0% (15)
	2019	100.0% (14)	–	–	100.0% (14)
I am encouraged.	2018	66.7% (10)	13.3% (2)	20.0% (3)	100.0% (15)
	2019	64.3% (9)	28.6% (4)	7.1% (1)	100.0% (14)
The teachers are fair to me.	2018	86.6% (13)	–	13.4% (2)	100.0% (15)
	2019	78.4% (11)	14.4% (2)	7.2% (1)	100.0% (14)
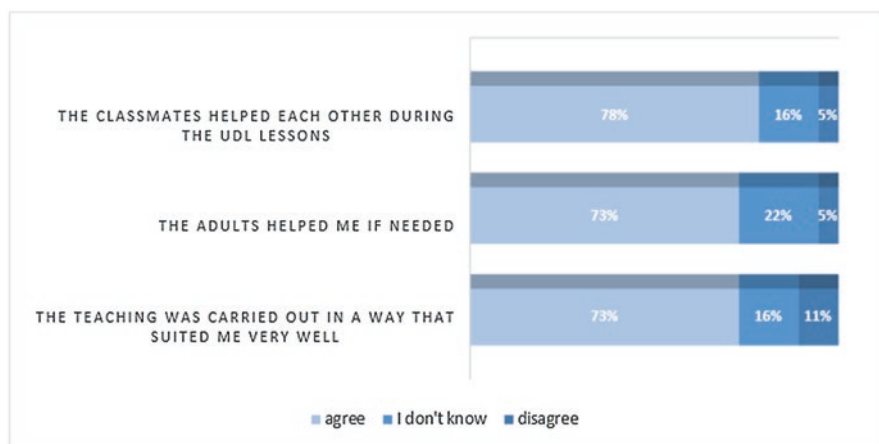
Fig. 10.8 Co-teacher's and first grade teacher's pupils' self-assessment of the teaching and support after the UDL lessons

When studying the results more explicitly, we did not find any statistically significant differences when analysing the data with Pearson's correlation (see Table 10.4 in Appendix 10.2).

After the actual UDL lessons in autumn 2019, the pupils from grade 1 and the co-teachers' third-graders ($N = 37$) took the survey '*This is what I am as a learner*', assessing their own experiences of the UDL lessons (Appendix 10.1). During analysis, we combined the original five categories into three categories. The results are illustrated in Fig. 10.8.

We can see in Fig. 10.8 the pupils' positive attitude towards the teaching and support. When analysing the correlative connection with Pearson's correlation between the grade level or the support level and the answers, no statistically significant differences were found (see Table 10.5, Appendix 10.2). Even when researching the answers individually, differences between the grade level or the support level and the answers could not be found; the most negative answers in the questionnaire were given by two pupils, one first-grader with general support and one third-grader with special support. Instead, the correlation between the appropriateness of teaching and how well pupils perceived adults in helping them was statistically significant

($r = 0.509**$, $p = 0.001$). In that sense, we can assume that the adults' help and support are very meaningful in the learning process.

Teacher Competence and Multiple Means of Action and Expression In this section, we utilise the MAP model to see what kind of teacher competence is needed when applying the UDL principle of multiple means of action and expression.

The multiple means of action and expression exemplifies the importance of a thorough command over the knowledge concerning the whole teaching and learning process which is interlinked with the dimension of *knowledge base for teaching and learning* of the MAP model. The dimension includes sub-dimensions of *content knowledge, pedagogical knowledge, pedagogical content knowledge*, *practical knowledge and contextual knowledge*, and it is seen to form the prime knowledge base for teaching (see also Shulman, 1987). The more structured the knowledge base for teaching and learning a teacher has, the more effortlessly she/he is able to apply it in different learning situations and in a heterogeneous classroom. The teachers had high expectations for all learners' achievements. According the principles of the UDL, instead of concentrating on learning obstacles, the teachers promoted the academic, practical, social and emotional learning of all learners (CAST, 2018). They asked their pupils to explain their answers to make sure the pupil had a good understanding of the concept. In addition, the communication enabled the other pupils to learn from each other's expressions.

The skills of reflection, creativity and clear communication resonate with the teachers' *cognitive thinking skills* of the MAP model (Metsäpelto et al., 2020). This dimension consists of five sub-dimensions, which are *information processing, critical thinking and problem-solving, creativity, communication including argumentation and reasoning, and metacognition*. In our research, the teachers' reflection in one's teaching developed their pedagogical actions. Teachers' reflection skills are underscored in many documents, such as in the Principles for Teacher Education in Europe (European Commission, 2005). Moreover, in the Profile of Inclusive Teachers, the value of personal professional development is mentioned (European Agency for Development in Special Needs Education, 2012). We can consider the teachers as reflective practitioners who think critically and solve problems by examining ideas, analysing arguments and synthesising information in order to modify the action and expression appropriate to the pupils (Binkley et al., 2012; Bagnato et al., 2013).

In the MAP model, the *social skills* contain four sub-categories. They are *relational skills, emotional competence, diversity competence and intercultural competence,* and they are all emphasised in the co-teachers and TA:s' pedagogical practices and activities of our research class. Together, the teachers and TA:s worked sensitively and with attitudes which prevented unequal treatment and marginalisation processes in the classroom community and promoted responses to individual differences in learning in ways that support and respect the dignity of each pupil (cf. Booth & Ainscow, 2011; Spratt & Florian, 2015). The awareness of the cultural context was especially important in our school case because the school was situated in the region of the Sámi people, an indigenous people in Finland. The teachers needed to navigate and communicate sensitively across the multicultural contexts (Bennett, 2009).

The last theme to be discussed here is the collaboration between professionals. According to Denham (2005), individuals need high-quality relational and

emotional skills in effective collaboration. The teachers took possession of the pedagogical leadership in their small professional team in their class. There were several parts to be fit together, including efficient communication and transmission of knowledge among the teachers and TA:s (cf. Lakkala et al., 2016). In our research classes, all the professionals, with their own particular knowledge and skills, were appreciated, and all employees had possibilities to participate in the process of planning and executing the teaching.

While inclusive pedagogy breaks out of the traditional paradigm of teaching alone (see e.g. Lakkala & Kyrö-Ämmälä, 2017), one would presume that the organisational level of pedagogical practices would be recognised in the UDL approach, too. In turn, the MAP model distinguishes three levels of pedagogical practices (Metsäpelto et al., 2020) of individual and group levels; organisation level; and local, national and global levels. When it comes to pedagogical leadership concerning inclusive pedagogies and UDL, the organisational level appears as an important level concerning the teachers' abilities to collaborate with colleagues, other professionals and parents.

In our research, the teachers were very competent in creating versatile learning environments for their pupils. Particularly, they utilized their abilities to build positive professional relationships to other professionals in order to enhance their pupils' learning and well-being. In this respect, our action research did not bring any new elements to teachers' pedagogy. However, the reflection with researchers on the applied practices raised the teachers' awareness of their situation specific skills and the competence behind them (Metsäpelto et al., 2020).

10.5 Discussion and Conclusions

In this chapter, we summarise the research results within the theoretical frames. Here, we reach the last phase of our action research. We distance ourselves from the practice and look at teachers' actions through theoretical lenses. We present the teacher competence that is required in the teaching process when applying UDL principles based on our research.

In our research results, we have focused on the most evident features of teacher competence that need to be involved especially when implementing the UDL approach in the context of inclusive education. In the results section, we introduced our data by presenting a few examples of teachers' everyday situations, where they observed, interpreted and made decisions that fit the time, place and context of their own class (Braun & Clarke, 2006). By analysing the everyday situations, we could identify the teachers' situation-specific skills (Metsäpelto et al., 2020) that can be paralleled to certain teacher competencies. We summarise the results of our analysis in Fig. 10.9.

Based on our analysis, the most wide-reaching dimension of teacher competence seems to be the teacher's *cognitive thinking skills*, which were interlinked to all three principles of UDL. The dimension is placed in the middle of Fig. 10.9. When implementing UDL, the teacher needs to be a reflective practitioner (Jay & Johnson, 2002) who evaluates his/her actions all the time and learns through and from the experiences, at the same time expanding new insights into the teaching profession
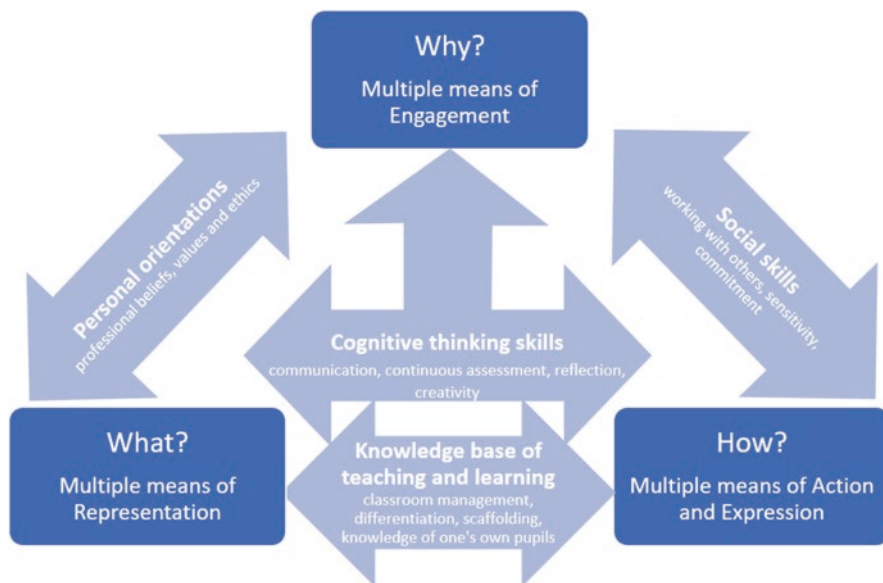
Fig. 10.9 Teacher competence required when applying UDL principles

and practice (Finlay, 2008). Furthermore, teachers' reflection and meta-cognitive skills are crucial because students benefit when teachers know how to teach meta-cognitive skills and self-assessment (see e.g. Annevirta et al., 2007). Cognitive thinking skills also involve communication skills. In a high-quality learning situation, the teacher is expected to communicate and articulate thoughts and ideas precisely and express arguments in a believable way (Deardorff, 2006).

On the left side of Fig. 10.9, we placed the dimension of teacher competence called *teacher's personal orientation*. Teachers' professional beliefs, values and ethics guide the decisions that they make in everyday situations (Metsäpelto et al., 2020). When examining the UDL principle called multiple means of engagement, the teacher's commitment to and responsibility for pupils and their learning came to the fore in our results. In inclusive education, teachers trust that all children can learn, that they are worth of education and that the teachers have the capacity to make the difference (Rouse, 2010; Florian & Spratt, 2013). A teacher with values that include a strong commitment to every child's right to a safe learning environment is likely to take care of students' well-being in the classroom (Metsäpelto et al., 2020). In addition, we linked the teachers' personal orientation to the UDL principle called multiple means of representation, where, while reducing barriers to learning, the teacher needs to get closely acquainted with the problems of each learner (Rose et al., 2014).

The dimension of teacher competence called *teacher's social skills* we positioned to the right side of Fig. 10.9. The teacher's ability to enhance pupils' sense of belonging and the cohesion of the heterogeneous group are important in engaging the students with their social community and studies. A sense of belonging and a positive and warm class atmosphere are significant prerequisites to pupils' well-being and quality of learning

(Pakarinen et al., 2010). They are seen as key elements of inclusive education (Bossaert et al., 2013). According to our previous research (Lakkala & Kyrö-Ämmälä, 2017), the collaboration between co-teachers, parents and other professionals is at the heart of inclusive education. The ability to manage classroom with the help of colleagues makes applying the multiple means of action and expression easier. Through collaboration, it is possible to construct a system of flexible support for pupils' learning processes. This way, teachers' solid social and communication skills are also important in interactions with adults (see e.g. Lakkala & Kyrö-Ämmälä, 2017).

The last dimension of teacher competence in Fig. 10.9 is the *teacher's knowledge base for teaching and learning,* which we placed at the bottom of the figure, in the middle of the 'what' of learning and the 'how' of learning. Teachers' knowledge base for teaching and learning is connected to the UDL principles of multiple means of representation as well as multiple means of action and expression. When teaching diverse pupils, the teacher utilises multiple ways of teaching and amends the curriculum, which requires an excellent knowledge of the subject matter (Tomlinson, 1999). In our research, teachers' knowledge base for teaching and learning included the following three sub-dimensions: (1) content knowledge, which indicates the teacher's expertise in the subject matter and refers to domain-specific knowledge (e.g. facts, concepts, phenomena) but also the teacher's understanding of the curricular content to be taught (Shulman, 1987; Baumert & Kunter, 2013); (2) pedagogical knowledge, with which the teacher manages the classroom, implements the learning theories in practice and promotes pupils' learning processes (Shulman, 1987; Guerriero & Révai, 2017); and (3) pedagogical content knowledge, which is the combination of expertise in subject matter (content) and pedagogical competence (teaching) (Kuusisto & Tirri, 2014).

Discussion Our research aim was to view the teachers' pedagogical practices in implementing the UDL model in the theoretical context of the MAP model of teaching (Metsäpelto et al., 2020). We studied the teacher competence needed when implementing UDL in the context of inclusive education in two heterogeneous classes. The main research question was to find out *what kind of competence do the teachers need when they teach using the UDL approach?* The research classes and their teachers were selected as a case for our research by the initiative of the teachers themselves. The teachers' co-operation took off while the special education teacher experienced loneliness when her special needs class was isolated from others. The teachers wanted to develop inclusive education utilising research-based knowledge. The teachers own willingness to develop as professionals gave us a great opportunity to carry out an action research process with them. After the co-teachers felt that they had adopted new insights in their teaching, they pursued to try out UDL principles in a larger scale. Therefore, the co-teachers invited a third teacher and her class to join the UDL lessons. Consequently, when examining the reliability and especially generalisability of our research, it should be noted that the results of the action research were built on the actions of very motivated and skilled teachers.

In some respect, the co-teachers' class was not a typical Finnish classroom. To begin with, there were atypically many adults at the classroom – two teachers and several TA:s. Furthermore, the group was unusually heterogeneous as besides the pupils with no special needs, there were many pupils with special educational needs.

The third exceptional feature in the co-teachers' class was that they did not use any study books; rather, they, with their TA:s, created the learning material by themselves from the basis of their pupils' needs, amending the curriculum.

Next, we will consider the UDL approach in wider contextual frame. When analysing the teachers' pedagogical practices, we noticed that the UDL approach concentrates almost only on the individual and group levels of teaching, ignoring the organisational, local, national and global levels, which, in turn, are considered in the MAP model. On the one hand, in many investigations, teacher effectiveness is often defined through the quality of the classroom processes, such as how to organise optimal learning environments and how to support learning processes (cf. Ball et al., 2009). But on the other hand, by concentrating on teaching at the individual and group levels, a meaningful part of the teacher's profession is ignored. Nowadays, a teacher is seen as a co-worker who acts in multiagency teams with other professionals and parents (Watkins & Donnelly, 2012; Florian & Spratt, 2013; Lakkala & Kyrö-Ämmälä, 2017). For example, in our research class, the co-teachers' collaboration with parents increased the parents' commitment to their children's schoolwork. The collaboration reflected positively on the classroom atmosphere and the pupils' outcomes. In addition, when the parents showed their appreciation towards the teachers' work, it had a positive influence on the teachers' well-being as well.

To continue on the subject, while the striving towards inclusive education has transformed the position of the teacher from a lone-worker to a co-worker, it has become very clear that inclusive education cannot be carried out by single teachers (see e.g. Lakkala & Kyrö-Ämmälä, 2017). On the contrary, many researchers and scholars argue that inclusive education is a whole-school or even a state-wide issue (see e.g. Hargreaves & Shirley, 2009; Jahnukainen, 2015). While inclusive education requires collaboration and a common strategy on the institutional level (Booth & Ainscow, 2011), a single teacher does not have the power of creating conditions where all learners' equal learning possibilities may take place. Another problem arises from the nature of inclusive education. When the learners' needs are responded to, flexible and transformable solutions are needed. Flexibility at the institutional level demands forums of discussion and collaboration for the professionals in schools (Lakkala et al., 2016). From the perspective of inclusive education, it can be problematic that institutions tend to 'finish' their procedures and may appear inflexible, holding on to the established education system (cf. Haustätter Sarromaa, 2014).

As stated above, the wider educational context, like the dominating learning concepts, have an effect on the pedagogical practices at the individual and group levels. In our case, the teaching of teachers can be characterised following the socio-constructivist learning conception. The roots of socio-constructivism go back to the theories of Piaget, Vygotsky and Dewey, but its influence on teaching has grown since the 1980s. Socio-constructivism implies that learners are encouraged to construct their own knowledge in realistic situations together with others, instead of copying it from an authority (Vygotsky, 1978; Kugelmass, 2007). The pupils construct the new knowledge upon the foundation of previous knowledge and experience; thus, the teacher has to be very well aware of the pupil's present structure of knowledge. In our research, the co-teachers' excellent knowledge about their pupils enabled them to amend their teaching and the learning environment according to their pupils' needs and strengths.

Finnish educational policies have their impact on the teachers' pedagogical actions in our case study. In Finland, teachers have a high degree of professional autonomy regarding the implementation of the curriculum. Finnish teachers have many opportunities to influence and develop their work. They can, among others, determine the teaching methods, learning materials and assessment strategies they use in their teaching (Sahlberg, 2010; Ministry of Education and Culture, 2016). Moreover, the Finnish Core Curriculum emphasises the meaning of assessment in terms of promoting and encouraging the student's learning process (FNAE, 2016). Thus, Finnish teachers are trained to pay attention to supporting their students' concepts of themselves as capable learners. Therefore, the national official norm probably guided the teachers in our research to apply positive feedback in their teaching as a rule. In addition, all Finnish teachers in comprehensive schools have master's-level teacher education, which enables them to utilise their research-based education in different ways (cf. Ministry of Education and Culture, 2016).

The last phase in the chart of the MAP model accentuates pupils' learning, motivation and well-being (Metsäpelto et al., 2020). In our research, we explored pupils' experiences of their studies by self-assessment via the surveys 'I as a schoolchild' (Aro et al., 2014), 'I as a learner' and sociometric measures. Although the survey 'I as a schoolchild' was delivered before and after the first UDL trials, no clear changes could be detected. However, the measurements gave a very positive impression about how the co-teachers' pupils felt about themselves as learners and schoolchildren. On the other hand, the measures also revealed negative attitudes, and often these were pupils with SEN. When interpreting the answers at the individual level, attention can be paid to the possibility that some child has a tendency of answering negatively, but the negative response can also reflect the real experience of the child (Aro et al., 2014). Yet, the results of the sociometric measurement revealed that the co-teachers' pupils had grown to appreciate each other's help in study tasks, but during the breaks, they were not willing to play with classmates who were bossy and cranky. The same kinds of results have been detected in previous research as well. Students with behavioural problems are the most rejected in school communities from both teachers and students (see e.g. Dodge et al., 2003).

Nevertheless, during our action research process, we could follow remarkable progress in many pupils' lives. For example, the pupil who was rejected by the other children in informal situations developed his social skills and started to trust that he could learn and that he was being cared for at school. Furthermore, this pupil's parents began to trust the teachers' good will and appreciation towards their son. After that, they were able to negotiate about the pupil's problems in a good spirit. The individual narratives show that respecting and caring for children enable confidential relationships to be established which, in turn, bear fruit in many ways.

As further research, it would be interesting to examine the adoption of the UDL approach and teachers' professional competence during teacher education, such as how to promote student teachers' competence in light of inclusive education. Research could also focus on the intentional formation of student teachers' professional identities as teaching practices seem to be based on the teacher's identity, attitudes and values (cf. Levin & He, 2008).

Appendices

Appendix 10.1: 'This Is What I Am as a Learner' Self-Assessment Form

THIS IS WHAT I AM AS A LEARNER

Evaluate your own work during the UDL lessons. From each line, choose the emoticon that best describes your own experience.

	I agree	I almost agree	I don't know	I fairly disagree	I disagree
I'm excited for to-day's studies.					
The classmates helped each other during the UDL lessons.					
I think the UDL lessons were nice.					
I understood well the things I studied.					
The adults helped me if needed.					
I learned something new during the lessons.					
The teaching was carried out in a way that suited me very well.					
After the UDL lessons, I know my best way to learn.					

Appendix 10.2: The Tables of Correlation (Tables 10.2, 10.4 and 10.5)

Table 10.2 Correlation between support level and pupils' experience of the UDL lessons

		Support level	An enthusiastic learner	Good understanding	Learned something new
Support level	Pearson correlation	1	0.000	0.079	0.000
	Sig. (2-tailed)		1.000	0.643	1.000
	N	38	37	37	36
An enthusiastic learner	Pearson correlation		1	0.211	0.356*
	Sig. (2-tailed)			0.209	0.033
	N		37	37	36
Good understanding	Pearson correlation			1	0.312
	Sig. (2-tailed)				0.064
	N			37	36
Learned something new	Pearson correlation				1
	Sig. (2-tailed)				
	N				36

*Correlation is significant at the 0.05 lever (2-tailed)

Table 10.4 Correlation between support level and pupils' experience of assistance, encouragement and justice (2018 and 2019)

		Access to assistance 2018	Access to assistance 2019	Encouragement 2018	Encouragement 2019	Fair teachers 2018	Fair teachers 2019
Support level	Pearson correlation	0.095	−0.125	−0.037	0.301	0.386	0.229
	Sig. (2-tailed)	0.737	0.0670	0.897	0.295	0.156	0.431
	N	15	14	15	14	15	14

Table 10.5 Correlation between support level/grade level and experience of assistance or suitability of lessons after the UDL lessons

		Support level	Grade level	Help from classmates	Help from adults	Appropriate lesson
Support level	Pearson correlation	1	0.510**	0.009	−0.003	−0.099
	Sig. (2-tailed)		0.001	0.958	0.985	0.560
	N	38	38	37	37	37
Grade level	Pearson correlation		1	0.046	−0.121	−0.085
	Sig. (2-tailed)			0.785	0.146	0.616
	N		38	37	37	37
Help from classmates	Pearson correlation			1	0.364*	0.157
	Sig. (2-tailed)				0.027	0.354
	N			37	37	37
Help from adults	Pearson correlation				1	0.509**
	Sig. (2-tailed)					0.001
	N				37	37
Appropriate lesson	Pearson correlation					1
	Sig. (2-tailed)					
	N					37

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

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Chapter 11
Good Practice in Inclusive Education: Participatory Reinterpretation of Already Existing Elaborate Classroom Practices Under a UDL Perspective

Michelle Proyer [iD]**, Gertraud Kremsner** [iD]**, and Gottfried Biewer** [iD]

Abstract This chapter presents well-established educational practices implemented at a school in Vienna with two decades of experience in school development in the context of inclusion. It elaborates on how these existing teaching practices can be interpreted from a UDL perspective. Furthermore, this chapter aims to underline the importance of engaging with teachers' perspectives in research efforts regarding the design of learning environments. Findings point to the advantages that the emphasized consideration of localized and societal backgrounds of students could add to the purposeful application of UDL.

Keywords Participatory action research · Reassessment of practice · UDL localization · UDL

11.1 Introduction: UDL from an Established Pedagogical Perspective

Considering Universal Design for Learning (UDL) as a strategy to supply individual approaches to facilitate teaching and learning environments in regard to specific learning needs (see Chap. 3), it is important to assess its local contextualization. As appropriate individualized ways of learning already existed before the development of UDL, the authors aim to use UDL-based perspectives to reassess the existing pedagogical and instructional practices. All of the above will be elaborated on and discussed in order to underline the importance of teacher engagement (also related

M. Proyer (✉) · G. Kremsner · G. Biewer
University of Vienna, Vienna, Austria
e-mail: michelle.proyer@univie.ac.at; gertraud.kremsner@univie.ac.at;
gottfried.biewer@univie.ac.at

to research processes as well as theory-practice-transfer) and the individualized design of learning environments that considers the societal background of students.

The main questions guiding the research process are:

How can existing elaborate practices in inclusive education be reinterpreted under a UDL perspective?

How can UDL enrich these existing practices?

How can contrasting perspectives help to highlight gaps in current teaching and thereby add to an even more child-centered practice?

The principles of UDL are rooted in empirical education research, developmental psychology, and cognitive neuroscience, and stem from the history of school research in North America. On the other side of the Atlantic, the European reform pedagogy movement of the twentieth century was a source of numerous developments for innovation in school teaching (Flitner, 1992). Especially in German-speaking countries, reform-oriented pedagogues referred to these theories and practical suggestions for inspiration and further development. The introduction of integrated education of children with and without disabilities was combined with the rediscovery of reform pedagogy at the beginning of the twentieth century. Reform pedagogy (with differentiated instruction [DI] as a current term) as opposed to UDL is embedded in different educational traditions. Both applications address the same phenomenon in existing school practices with different scientific terms. In line with this, this chapter highlights the fact that some of the underlying ideas of UDL already form part of well-established teaching practices, which have other historic and/or systematic roots but might hint toward further ideas for innovative developments. Thus, it will be used to reinterpret current teaching practices and contrast them with established perspectives in order to promote child-centered holistic approaches.

History and Present of the Austrian Education System with a Focus on Schooling for Children with Special Educational Needs and a (Forced) Migratory Background

Selected historical background of societal and school-related development in Vienna is important for an understanding of this chapter, as the roots of reform-oriented schools in German-speaking countries differ from the scientific foundation of UDL. Nevertheless, similarities may be found in certain fundamentals of teaching and learning.

The Dual Monarchy united a number of linguistic groups in Middle and Eastern Europe and the Balkan area. Though the official language in the capital Vienna was German, a number of other languages, including Hungarian and different Slavic languages like Czech, were colloquial as well as official languages in different parts of the Austro-Hungarian Empire. Among other factors, this linguistic influence has been a driving factor behind Austria's culturally diverse population. Vienna has seen

several phases of the migration of large groups from other countries in its recent history. With respect to the last phase of immigration, forms of emergency education even had to be rapidly setup in a question of months, as described by Proyer et al. for the years 2016 and 2017 (Proyer et al., 2019).

The first education models for deaf and blind children were developed at the beginning of the nineteenth century in Vienna. There were also a few experiences with children with so-called intellectual disabilities in the middle of the nineteenth century.

A number of remedial education schools were established in the 1920s, especially in Vienna and some other Austrian cities (Gstach, 2019, 27). In the same period and during the early 1930s, new concepts of remedial education emerged which influenced the whole region as well as neighboring countries like Hungary (Zászkaliczky, 2008).

The time of National Socialism brought a dramatic halt to the development of school support for children with disabilities and 7 years of destruction for the educational structures that had emerged in the 1920s and early 1930s. Most of the persons with intellectual and severe disabilities were murdered by the National-Socialist which finally collapsed in 1945 with the invasion of the Soviet army.

After this abrupt halt to all efforts concerning the education of children with disabilities, a historical fast forward leads us to disability activists and with them the disability rights movement, but also parental movements for the integration of disabled students surfaced at the beginning of the 1970s (Biewer, 2017, 227). In German-speaking countries, reform-oriented teachers and researchers joined the parental movement and provided them with ideas as to how schooling with highly diverse classrooms could be implemented. It was a time of rediscovery of the international reform pedagogical movement, which arose in the first few decades of the twentieth century through the conceptual ideas of Maria Montessori and Peter Petersen and continued with contributions from Celestin Freinet and others. The first integrative classrooms for children with and without disabilities, which were established in large German cities such as Munich, Hamburg, Berlin, and Cologne, referred to this reform pedagogy heritage. This reform process and the references to reform pedagogical ideas by teachers have been well documented in a large number of scientific studies (Biewer, 2001).

Nevertheless, in Austria, the first official integrated classroom for children with and without disabilities was established only in 1984 in the small town of Oberwart in the province of Burgenland at the frontier with Hungary. An oral history research study conducted with the actors of this process revealed the roots and sources of this process (Bundschuh & Polster, 2012).

The Austrian school organization law was in fact modified in 1993 and introduced some significant changes for the special educational system. Parents of children with special educational needs (SEN) in primary schools (grade 1 to 4) in Austria were given the right to decide whether their children should attend special schools or integrated classes. Three years later, integrated classes were established for grades 5 to 8 of secondary schools through a follow-up law. In 1997, the first integrated classes were setup.

Importantly, and besides the still existing system of special schooling, two integrative models were implemented: "integrated classes" with permanent double-staffing by one regular and one special schoolteacher, and so-called "support teacher classes," which are attended by special educators only for a limited number of hours per week. The latter model is now widespread in urban areas. The model of support teacher classes was particularly suitable for schools in rural areas with few children with special educational needs, while in cities the model of integrated classes dominated. In the city of Vienna, more than 300 classrooms with this form of double-staffing exist in primary schools (grade 1 to 4) and 350 in secondary schools.

In the years after the new legislation, integrative models expanded across the country, albeit maintaining the previous special school structures to varying extents (Biewer, 2017; Biewer & Proyer, 2017). In 2004, Austria had a 3.6% rate of students with SEN in grades 1 to 8, half of them attending special schools and the other half educated in integrated or support teacher classes. At this time, 2% of children were attending special schools. As a result of this legislation, most children with SEN attend regular schools. Since 2004, the rate of children with SEN in compulsory education has increased slightly to 4%, with less than 2% still in special school settings.

The large number of students with a migratory background is an important factor when considering teaching in heterogeneous classrooms, especially in Vienna. The legislation of the 1990s focused on children with SEN, without contemplating the intersecting backgrounds of disability and migration (Luciak & Biewer, 2011). In Vienna, where most schoolchildren have a migratory background in their family (when including second and third generations), this approach is problematic.

Current trends toward inclusion in school point to different local variations in Austria (Nationaler Bildungsbericht Österreich/National Education Report Austria, 2018). Federal structures lead to different levels of schooling in specialized, integrative, or so-called inclusive or hybrid settings, while mirroring similar tendencies common in Europe. Integration at primary level is widespread, whereas a number of individual, social, and institutional factors compromise the development of elaborated classroom practices for inclusion at secondary school level (Biewer et al., 2015). Recent efforts in education policy aim to further establish inclusive structures, while at the same time maintaining special educational expertise. Teacher education in Austria has seen stark changes (Buchner & Proyer, 2020), with training in developing inclusive teaching materials being one of the cornerstones of the curriculum.

Schulzentrum Donaustadt: The Institutional Development of the School

The research on which this chapter is based has been conducted in "Schulzentrum Donaustadt" (henceforth referred to as SZD), an inclusive secondary school for children and youths between the ages of 10 and 15 in Vienna. The school is located in "Donaustadt" (equivalent to "Danube City" in English) in a part of Vienna east of the main arm of the Danube river. This part of the city is not an area where socially privileged families with high incomes live, but it is also not a region with concentrated multiple problems. It is typical of the mixture of different groups we find in most parts of the city as a result of long-standing urban planning measures. That is to say, earlier urban planning measures are relevant for the description of the educational environment.

The school has a number of students with SEN, but even more students with a migratory background and/or from socially disadvantaged contexts. The school has a long history of teaching heterogeneous groups and developing appropriate teaching methods. By analyzing the existing teaching and education methods, the study shows that many of these can be reinterpreted using the UDL framework, though the theoretical background of their development is different. Elaborating on this perspective is at the core of this chapter.

Prior to 1997, the school was a center for special needs education, consisting of special education classrooms (Abels, 2015). Now it is a mainstream school, consisting of inclusive classrooms without special classes. The 20-year period that has elapsed has therefore been a time of school development and of transformation of the school's structure. In 1996, the school began with its first integration classroom. Within a few years this had advanced to being the structural model for all classrooms.

In the school year 2019/20, the school had 200 students in grades 5–8, in 11 classes. Nine of these were recognized as integrated classes with students with and without special needs. The two other classes, called "Aufbaulehrgang," were for students who temporarily needed more support in their learning activities than others.

In 2015, SZD received the status of a cooperation school of the University of Vienna ("Kooperationsschule +"). This status is given to a small number of schools which collaborate in teacher education over several years and develop sustainable structures in this area. In these years of cooperation, a number of common activities have been arranged between university and school staff, and university students and students, as well as various research activities between university students and lecturers. Working at eye level is of high importance in this collaboration, as both parties (university and school) take the view that sustainable change for educational practice can only be realized together.

One example of prior explorations of research activities related to learning environments will be briefly introduced in the following: Spaces for inclusive instruction in the sense of Universal Design depend on the existence of different activity zones. Children with disabilities need retreat areas as well as activity zones and areas for contact and social development. A Master's thesis from the Department of

Education of the University of Vienna analyzed social space in the process of inclusion in this school in the years 2018 and 2019 (Sikorskaya, 2019). Its core question was: Is there a connection between space and the way people perceive themselves? Based on the assumption that spaces are regarded as catalysts with effects on social space and disability, the author found that the school provides spaces for preparation of students and arrangements which generate regulations regarding placements. Differences become irrelevant and disabilities are no longer visible in the social arrangement of the school.

Plans to follow-up on this research in an established research context to gain longitudinal results and work on sustainable improvements to learning environments of students with disabilities and/or a migratory background have had to be delayed, and this has also affected the process and depth of data analysis for this specific data set. This is why this chapter focuses on the analysis of data related to parents and teachers.

SZD symbolizes the end result of this process. It started as a school for children with special needs and developed into an integrative school by reducing the number of students with special needs and replacing the school population with children without special needs. This also takes time and can only be successful if the pedagogical approach of the school is elaborated in such a way that it is attractive to the children in the area. That is, the focus should be on pedagogical and instructional approaches which involve each child and transform the school into a place which parents want for their children, and where students want to be and learn.

Methods of Collaborative and Individualized or Diversified Instruction at SZD

The current pedagogical practices in the school are the result of the specific institutional development described in section "Schulzentrum Donaustadt: The Institutional Development of the School". School practices will be presented as described in documents of the school. Most were written for public presentation of the activities; others arose through the internal school development process. This shows the lack of academic documentation of inclusive school development. In the documentation, the school development team describes the didactic concepts that they use in relation to twentieth century reform pedagogy, with references to, among others, Montessori, Petersen, and Freinet (source: internal school documents).

Simone Abels, a researcher in the didactics of natural sciences, described the experimental forms of learning at SZD in her subject (Abels, 2015). As Abels reported, research-based learning is implemented in two organizational forms called "box lessons" ("Schachtelstunden") and "learning workshops" ("Lernwerkstatt") (ibid. 141). During "box lessons," students can choose from a number of exploration and learning settings. More than a hundred materials are prepared for an overall topic, e.g., water, insects, or light and color. The boxes contain instructions,

materials for activities, and self-directed control of solutions. The students choose the actual topics in the given area and whether they want to work alone, in pairs or in groups depending on the topic. At the end of an activity, the students write a protocol. In regular sequences, activities of the past months are reflected on with the teacher and an evaluation sheet is written by teachers and students in a collaborative manner. The materials recall the type of material used in the area of "cosmic learning" in Montessori pedagogy and the teaching interactions recall the well-known interactions found in the pedagogy of Peter Petersen and Celestin Freinet.

The "learning workshop" enables days-long, research-based, interdisciplinary, autonomous explorative learning on the actual school premises. The whole class works on one topic for 4 days. The room where the "box lessons" normally take place, referred to as the "learning workshop," is a room fully equipped with free accessible materials to inspire students to develop their own questions (ibid.). Each of the activities forms part of one of the overall topics as described above which can be from either the natural or social sciences. Again, students choose whether they want to work on these topics alone, with a partner or in a group of three or four persons. Teachers supervise the work of the students and help them to find appropriate questions and projects. The students might work for several days on a topic, using a research diary and presenting their results to the other students at the end.

11.2   Methodology and Database

The following section will introduce the methodology used to collect and analyze data, a specific facet of Action Research – (Critical) Participatory Action Research – will be presented as our approach for the collaborative collection of data. This section will be followed by the introduction of methods from Constructivist Grounded Theory as our chosen approach to analyze data gathered from the action cycles. Finally, the research ethics – which are of particular importance for every participatory approach – will be discussed.

(Critical) Participatory Action Research Cycles

Research activities in Austria were guided by applying Participatory Action Research (PAR, see Chap. 4 for details), as it is particularly suitable for the transformation of school cultures and the empowerment of both teachers and students (Armstrong & Moore, 2019). This is particularly significant when it comes to the paradigm shift from segregation and exclusion toward inclusion. Armstrong and Moore (2019, 7) therefore suggest drawing together a "manageable piece of research which increases understanding about the barriers to inclusion and challenges exclusionary practices, and in which collaboration with others is possible." PAR in educational contexts promotes democratizing research through fundamentally valuing

and incorporating the perspective of people forced to deal with exclusion – regardless of whether they experience it on the receiving or on the (re-)producing end (ibid.). Against the backdrop of our research topic, it is therefore no surprise at all that we opted for this approach. SZD consequently is in the process of extended transformation into an inclusive school, even though the school system in Austria may not be described as an inclusive one at all (see section "History and Present of the Austrian Education System with a Focus on Schooling for Children with Special Educational Needs and a (Forced) Migratory Background" for more detailed information). In Critical PAR, "the reciprocity between practitioner–researchers and others in a setting is amplified even further: responsibility for the research is taken collectively by people who act and research together in the first person (plural) as 'we' or 'us'. Decisions about what to explore and what to change are taken collectively. In this case, however, people explore their work and lives as socially constructed formations that may need to be transformed if their work and its consequences are irrational, unsustainable or unjust" (Kemmis et al., 2014, 16).

The final plan that was implemented consisted of the following phases and elements:

1. *First cycle – Analysis of barriers for learning and good practices (school year 2018/2019)*: In this step, barriers for learning, as well as examples for good practice, were analyzed based on data stemming from students as expert learners in the 8th and 5th grades, their teachers, and (some of) their parents.
2. *Second cycle – focus on social interactions, intervention, and reflection (school year 2019/2020)*: Based on the results from the first cycle, we decided to continue collecting data from the "new" 8th graders as (potential) school leavers as well as from the "new" 5th graders as newcomers at SZD but also from the "old" 5th (and now 6th) graders to have follow-up data from an already known group.

Focusing on these three age groups was based on the decision to not only collect barriers and good practices (as during cycle 1), but rather to focus on social interactions in, during, around, and outside class as important factors that may hinder or foster learning. Interviews with teachers and workshops with students as well as the so-called "Buddy Books" (see next segment for details) turned out to be valuable resources for the second cycle. Additionally, teacher trainees interning at SZD from October 2019 to February 2020 supported the data generation. Based on a joint decision with teacher teams from all grades, these teacher trainees were asked to observe, but also to plan and to implement UDL-based lessons and to present, discuss, and reflect both their approaches and their observations with teachers at SZD. In doing so, teacher teams were able to gain insights into their daily job routines from an outside perspective and subsequently enabled to reflect on potential "blind spots." Furthermore, teacher teams learned how to use UDL in their classes by observing the teacher trainees.

The two research cycles with the actors involved in the research routines can be illustrated as follows:

The classical model of an Action Research Cycle tends to depict each step as a separate process. However, as can be seen in Fig. 11.1, specific activities were more
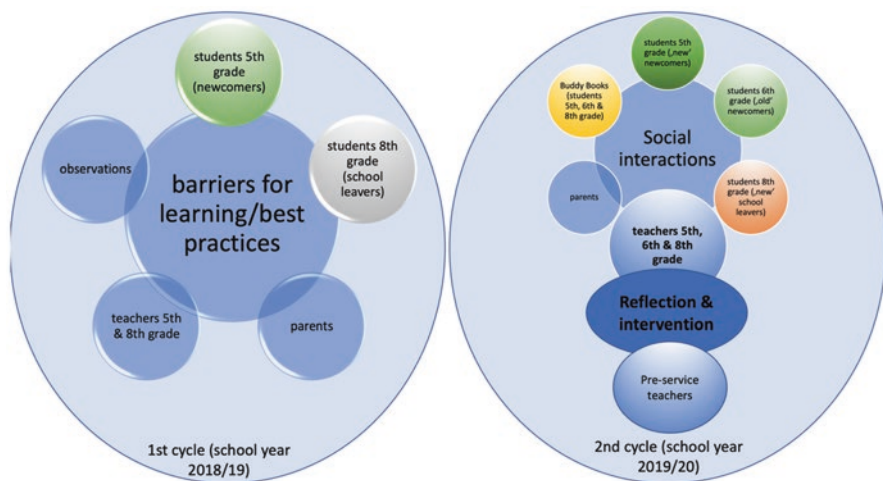
Fig. 11.1 Implemented action research plan at SZD and actors involved

interlinked and ongoing exchanges with the three collaborating teachers led to some overlapping layers that present a more holistic picture.

Data Material

Stemming from the Critical participatory action research approach as described above, we – all team members including the practitioner-researchers as well as academic researchers and research assistants (that is teacher trainees employed in the project) – collected a wide range of data with an initial focus on barriers for learning. In order to get the broadest possible picture, data from all the parties involved were collected. Certain settings such as parent–teacher meetings provided opportunities to reach large numbers of parents at the same time, while other situations called for written interviews or structured notes taken from team meetings to meet the needs of the teachers involved. Understandably, teaching teams could not afford to spend a lot of time on oral group-based interviews. Nevertheless, oral interviews with three teachers were conducted regularly to gain in-depth insights into the daily work of the teachers. Student-sourced data was collected in workshops, in which students were divided into four groups. Additionally, 6th grader Buddy Books were (and continue to be) analyzed.

Table 11.1 shows an overview of all the data collected.

Due to the extensive data set and the continual exchanges with the collaborating teachers hoping to get immediate feedback, the authors focused first on an analysis in reference to the parents and teachers. At the time of writing, a detailed analysis of

Table 11.1 Detailed description of data material

Name	Content	No.	Date	Grade
Notes from a conference with students, parents, and teachers	Barriers for learning from students, parents and, teachers' perspective	6	October 2018	5th, 8th
Notes on talks with parents (from a conference with parents and teachers)	Barriers for learning from parents' perspective	3	December 2018	6th
Buddy Books	*Barriers for learning from students' perspective, social interactions in, around, and outside class*	*28*	*Unspecified; winter term 2019*	*6th*
Notes from a conference with parents and teachers	Barriers for learning from parents' perspective, social interactions in, around, and outside class	3	November 2019	6th
Observation protocols	Observation of situations in class (focus on barriers for learning)	3	November 2019	5th
Interview with teachers 2 and 3	Barriers for learning from a teacher's perspective, social interactions, challenges, and opportunities through the implementation of UDL, already existing good practices	1	November 2019	6th and 7th
Notes from teachers' team meetings	Barriers and opportunities for learning from a teacher's perspective, social interactions, and implementation of UDL	3	November 2019	5th, 6th and 7th
Interview with teacher 1	Barriers for learning from a teacher's perspective, social interactions, challenges, and opportunities through the implementation of UDL, already existing good practices	1	December 2019	5th
Workshop with 8th graders	*Barriers for learning from a student's perspective*	*4*	*December 2019*	*8th*
Questionnaires with teachers	Approach to UDL	3	January and February 2020	5th, 6th, and 7th
Interview with teachers	Already existing good/best practices; approach to UDL, opportunities and challenges with the implementation of UDL	1	March 2020	5th, 6th, and 7th
Interview with teachers	In-depth insights into already existing good/best practices; history and current developments and (potential) future of SZD	2		

student-sourced data – marked in italics in the table above – is still underway but will not be referred to.

In the first Action Research Cycle in the school year 2018/2019, the aim was to find out as much as possible about barriers for learning as experienced by students, teachers, and parents. This constituted the first phase of data collection but can also be considered as a first approach to sensitize students, parents, and teachers in terms of a careful and detailed reflection on what students might need to learn best and how their learning environments should be designed.

In a first step, parents, students, and teachers from all three 8th grade classes were asked to write down what they considered as barriers for learning on forms provided in the context of a parent-teacher conference in October 2018. The project team decided to focus on this grade due to the particular challenges reported by one of the teachers: namely that as the students left school after this school year pressure on the students and teachers (and indeed the parents) was extremely high.

The project team also decided to collect at least some (although not extensive) additional data from 5th graders and their teachers and parents. These students had just started in SZD and their teachers were just getting to know them. We decided to collect these perspectives in order to have a group of students and parents to follow over two consecutive years.

One year later, and now in our second Action Research Cycle (school year 2019/2020), this same group was now in the 6th grade. Again, in the context of a parent–teacher conference (in November 2019), parents were asked to write down the barriers which hindered their children from learning. Particular focus was also put on social interactions in, around, and outside the classrooms.

The perspective of students was not captured using paper and pencil (as for their parents), but via an analysis of the so-called Buddy Books (Perkhofer-Czapek et al., 2018). Selected classes at SZD are using these books to plan, track, and provide both student and parent feedback on their learning progress. Grades 5 and 6 use the same edition, while grades 7 and 8 have a specific version for older children.

Buddy Books serve as a data source to learn about perspectives not only on barriers, but also on helpful aspects for learning progress. In total, 28 Buddy Books from 6th graders (former 5th graders, see above) were screened. An in-depth analysis, including of the capture of the actual words of the children, is ongoing. Additionally, workshops were held to assess the perspectives of 8th graders as school leavers. These took place in two different 8th grade classes in December 2019.

In addition to the data collected as described above, teachers of the "new" 5th graders, but also of 6th and 7th graders, were asked to share their perceptions of barriers for learning and factors which might improve learning. They were also asked to focus on social interactions in, around and outside class. This data collection took place during teachers' team meetings in November 2019 and had the additional aim of allowing teachers to reflect on their perceptions. Furthermore, one team member undertook school observations in 5th grade to complement the data and – as is intended when implementing Action Research – to give feedback to teachers. The school observations took place in differing settings: one in a special needs class with two students only, and another two in "regular" classes with 9 and

11 students. These observations were used to identify given settings that were reassessed from the UDL perspective.

Interviews with all three practitioner–researchers were conducted to provide in-depth insights into teaching styles and perceptions of barriers for learning as well as of factors that improve learning but also on social interactions in, around, and outside classrooms. Particular focus was put on reflections on challenges and/or opportunities through the implementation of UDL. Each teacher is responsible for one grade only: one is a 5th grade teacher, another one is responsible for the 6th grade, and the third person teaches 7th graders. Even though this data (interviews supplemented by written statements) offered extensive insights, it proved to be increasingly necessary to ask even more in-depth questions. Therefore, all three teachers were requested to attend a second round of interviews which took place in March 2020, followed by two follow-up interviews in summer 2020.

It is important to point out that the specific impact (such as adverse effects) of the COVID-19 pandemic and the corresponding preventive measures on the implementation of developed practices is still being monitored. Nevertheless, it must be noted that a general impact of the pandemic on inclusive practices at SZD as such can be observed. For example, the restricted options for a physical mixing of different groups of students have taken a toll.

Constructivist Grounded Theory

In the context of (Critical) Participatory Action Research, a flexible approach to organizing and analyzing data is key. We decided to utilize Grounded Theory methods for this purpose, as those methods match our chosen approach (as will be shown in this subsection). However, it should be noted that we only apply Grounded Theory methods in the context of the corresponding design and analysis of our (Critical) Participatory Action Research project.

Considering these analytical steps, it is clear that (Constructivist) Grounded Theory and (Critical Participatory) Action Research are a perfect match, particularly when considering the simultaneity of data collection and analysis. Our second Research Cycle was planned and implemented on this basis only (see Figs. 11.2 and 11.3 for details). Charmaz' approach to Grounded Theory specifically meets the chosen approach of our project when she calls for observational data to be additionally fed into the analysis of interview material because "what people say often differs from what they do" (Charmaz, 2004, 982). This clearly is of utmost importance when practitioner-researchers are searching for insights into their teaching practice: it may be easy to describe and explain inclusive teaching practices in a face-to-face interview, but this does not necessarily mean that such practices will be observable in daily work routines. Accordingly, both in-class observations as well as workshops with students were planned as emerging needs after the initial data collection and analysis in the first Action Research Cycle.

- Strategies
    - Reflection of teaching goals_T
    - Individual strategies (and structures) for better learning_T
    - Strategies (and structures) for good learning environment_L
- Strengths
    - Methods and Tools to strengthen competences_T
    - Diversity as strength_T
    - Consideration of pupil's strengths_T
- Barriers
    - Individual barriers for learning_T_Pa
    - Barriers for learning in general_T
    - Barriers for learning at home_T
    - Barriers for learning_what can teachers do_T
    - Barriers for learning in class_T
- Additional actors and living environments_T
    - Role of T for students_T
    - Contact with parents_T|
- Resources: time, space, teacher education_T

Fig. 11.2 Clipping from initial coding process of teachers' data
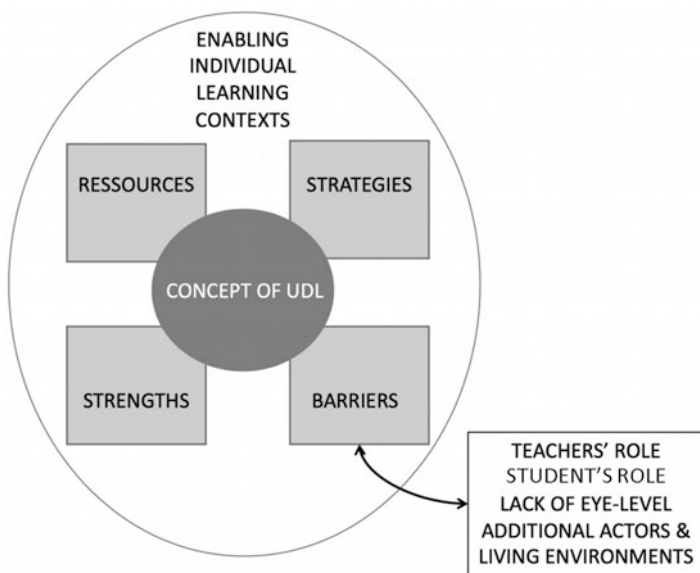
Fig. 11.3 Illustration of findings applying Grounded Theory Methodology

According to Charmaz (2003, 2004, 2014), coding data via Constructivist Grounded Theory means to start with initial line-by-line coding to examine each line of data and to define actions or events therein. In doing so, we start to build ideas inductively and "are deterred by line-by-line coding from imposing extant theories or our own beliefs on the data" (Charmaz, 2003, 258). It also helps to

sharpen the use of concept sensitization. In this step, the background ideas that inform the overall research problems will be carved out. In a next (and – specific to Grounded Theory – also parallel) step, constant comparisons need to take place: all data has to be regularly compared in terms of:

1. Different people (their views, situations, actions, accounts, and experiences) occurring within the data (which we did by collecting data from all the groups represented at SZD)
2. Data from the same individuals but at different points of time (which we collected from the same group of both teachers and students from certain grades)
3. Comparison of incidents (which we did by focusing on specific yet comparable incidents such as the learning workshop or the Buddy Books)
4. Comparison of data within a single category (as illustrated in the findings section, Fig. 11.2)
5. Comparison of data from different categories (as illustrated in the findings section, Fig. 11.3)

For our project, different kinds of coding were applied. Since it was not a single person who worked on our data but rather a team, we decided to code the data via MaxQDA, a software specifically developed for qualitative data analysis. MaxQDA facilitated our collaboration as a research team by allowing the digital sharing of both (coded) data sets as well as memos (see Fig. 11.2 as an example).

Research Ethics

In accordance with our methodological approach, a wide range of ethical considerations had to be considered. Even though every research project should carefully reflect on ethical considerations, this is of particular importance when participatory approaches are being applied due to the close collaboration with practitioner–researchers. Kemmis et al. (2014) show the importance of this issue by dedicating an extensive chapter to research ethics in their book *The Action Research Planner. Doing Critical Participatory Action Research*. Research ethics in the context of Participatory Research are also intensively discussed in Kremsner (2017) and Kremsner and Proyer (2019), among others.

First and foremost, it has to be stated that every research study should consider the following general principles as described in Kemmis et al. (2014, 159):

1. *Respecting Persons* means that research should always respect participants' "integrity and humanity as persons – as people whose rights and whose physical and psychological and cultural integrity must be protected, and not damaged, in the research process."
2. *Avoiding Harm* is defined as "not only avoiding physical harm or hurt, but also psychological harm (for example, stress or anxiety) or other harm like depriving participants of esteem, or taking them away from educational activities they

would have been occupied in had the research not intervened, or in any way damaging their reputations."

3. *Justice* in research "requires avoiding injustice in the process of the research, for example, by processes that oppress or dominate participants."

4. *Beneficence* "requires that research be undertaken in the interests of the people involved and affected, in the interests of the whole human community, and in the interests of the sustainability of the Earth."

Taken these general principles into account is of particular importance when children are involved in research contexts, as is clearly and unequivocally pointed out by, amongst others, Greig et al. (2013).

Informed consent is (or at least should be) key to all research projects (McClimens, 2007). Participants have the right to know all the information available about a research project and its process before they can agree or not to participate. Concerning our project, informed consent was obtained in differing ways from all the participants:

1. Practitioner-researchers constantly gave their consent for using and utilizing their data both orally (taped in the context of interviews) and in written form.

2. Students – or rather their parents – signed an informed consent form at the beginning of each school year. Even though constant and repeated informed consent is specifically preferable when working with children (Greig et al., 2013), we were requested by the school to avoid the repeated filling in and signing of forms by parents. Instead, all parents were provided with written information about the project at the beginning of each school year (when they were asked to sign informed consent forms) and were presented with further information at the teacher–parent conferences (if they attended) where all three practitioner-researchers were present. Even though they were not asked to fill in forms, the students themselves nonetheless received constant information about the project, its aim and progress through the three practitioner-researchers, who regularly discussed UDL-related issues with their classes.

3. The parents themselves were asked to participate in the project only in the course of the teacher–parent conferences, where they were asked to answer questions in written and anonymized form only. In other words, we did not specifically ask the parents to again fill in informed consent forms, but to anonymously fill in questionnaires. Those who did so effectively gave their consent by placing the filled-in questionnaire in the boxes prepared in advance.

Anonymity is widely guaranteed for all research participants except for the three practitioner-researchers. As key members of the research team, they play a crucial part in the research process and its outcomes and therefore need to be cited by name. Direct citations later in this chapter are still anonymized in order to guarantee some basic levels of privacy for the three highly involved teachers. For all other participants, full names have no importance for the project and were therefore only documented in the context of informed consent. For the academic part of the research,

neither the students nor the parents' names are even known: their data was mainly collected by the practitioner-researchers and student assistants.

The chosen research approach asks all involved parties to engage and invest considerable time and energy. Openness and transparency among the research team proved to be of utmost importance. Examples of the practitioner-teachers' valuable contribution to making this research possible include the ongoing reflection of practices and involving colleagues as well as providing access to their own teaching practice.

11.3   Research Process, Results, and Discussion

The following section will describe, in detail, the results of the process undertaken in the application of the (Participatory) Action Research approach and the role the collaborating teachers played in enabling access to the field and shaping the data collection. In essence, it presents the outcomes of the process and related questions. The theoretical and practical implementations that derive from these findings will also be discussed. In view of the fact that it has not been possible to conclude the final Research Action cycle (and thus the implementation steps and the discussion of the findings, especially with students), the following will focus solely on data concerning the teachers and parents.

Applying Participatory Action Research to Reassess Teaching Practices

As suggested by Armstrong and Moore (2019), setting up a small group of practitioners and researchers which will work on all stages of the project may be the most important early step. In our case, the team was already in place due to a pre-existing collaboration in the Erasmus+ − project "TEP." Hence, three academic researchers (Gottfried Biewer, Michelle Proyer, and Gertraud Kremsner) worked closely together with three female practitioner-researchers from SZD (Gudrun Messenböck, Katrin Krischke, and Beatrix Wagner). These six people were fundamentally supported by three research assistants (Sophia Baesch, Johanna Grath, and Susanne Prummer). The application of a Participatory Action Research approach in our project meant that we tried to share as much power over the research process as possible with all team members irrespective of previous research experience.

For our project, all three practitioner-researchers were clear from the very beginning about their expectations from the TEP project and indeed from us as academic researchers. Aware of the many challenges that they have to face on a daily basis (and always at the risk of self-exploitation) to reach their goal, they wanted SZD (and with it their own teaching) to become (more) inclusive, or at least as inclusive

as possible. The collaboration provided a space for reflection upon their ongoing teaching practices and enabled shared nonjudgmental spaces to discuss ideas and problems. Their hope was that the UDL-centered reinterpretation process might not only serve as a strategy to attain their individual goals, but also to motivate their teacher colleagues to join them and, thus, guarantee a sustainable implementation of – or reference to – UDL. Both Action Research cycles were developed according to this goal in close collaboration with all three teachers. Additionally, researchers supported them by translating English academic material (such as the UDL guidelines) into more comprehensible and easy-to-digest German texts suitable for everyday school life. At this point, it has to be mentioned that the research team as well as the three involved teachers were well aware of the challenges of sustaining or, even more so, implementing UDL at school. This is especially true as change in a dynamic field such as school tends to appear slow and is hard to implement.

An initial assessment of what facilitated and hindered the students' learning processes was the starting point for the data collection process and was inspired by a CAST workshop (http://www.cast.org/) that formed part of the first project meeting. As well as allowing the three teachers to present the main ideas of UDL to their colleagues, the assessment of barriers and facilitators also initiated a discussion process among teachers, parents, and the school heads. Interestingly the main research interest – enhancing the learning environments for students – coincided with topics related to the ongoing inclusive school development process. The three collaborating teachers made it clear right from the beginning that the initial questions might necessarily have to be adapted for several reasons. First, it was hard to grasp the idea of UDL as there was no usable material in German. Although two of the teachers had majored in English it was hard for them to find time to read complex academic texts and take on board the underlying UDL model. Second, the three teachers suspected that some of their colleagues at school would not be eager to reflect on their own teaching, especially not using a complex model. And third, it was quickly concluded that many of the boxes describing UDL in practice could already be ticked for many of the practices in place. The teachers made it clear that it was important for them to work with concrete cases and further develop any good teaching practices already in place. So, even before entering the cycle of research activities, a detour to breakdown the complexity of UDL in its interpretation by CAST was necessary.

The findings of the assessment of teachers' opinions will be presented below. As the identification of what hinders and what facilitates learning was considered to be crucial, the three teachers decided that it would be better to collect the data from their colleagues themselves. Different data collection techniques were implemented among the different teams. These included collecting hindering and enabling factors in the course of teacher team meetings and leaving posters with the two questions in the teachers' room which they could fill in. The following factors were recorded (Table 11.2).

Interestingly, the teachers listed a number of factors that are related to the learning environment at the school and in the students' homes. These include references to suitable learning environments, which includes aspects such as furniture but also

Table 11.2 Selected facilitators to learning according to the teachers

Learning facilitators
1. Motivation
2. Quiet environment
3. Routines, security, rituals
4. Environment (furniture, climate, technical equipment)
5. Engagement
6. Motivated teacher
7. Praise
8. Steady environment
9. Learning strategies (learning/coaching), learning in small groups
10. Good atmosphere at home
11. Possibility to try out things
12. Freedom to think
13. Being allowed to experiment
14. Eating and sleeping
15. Reading

to the importance of silent environments. They also referred to personalized factors of the children, such as a lack of cognitive ability or a limited ability to concentrate. Many of the challenges reported are related to these personal or societal factors, while the facilitation of teaching is often referred to using technical terms such as learning strategies. Problems about staying focused and restless environments are referred to as especially challenging and were mentioned more than once. This became an even more pressing issue when the findings of the parents are considered (see below).

Following up on this initial data collection, a number of interviews were conducted over the course of the research process in order to clarify open questions and learn about current teaching contexts and the UDL perspective on them. The factors restricting and facilitating the learning environments were discussed among the teams and with the researchers in the course of four interviews with teachers and groups of teachers. These were analyzed by applying methods from Constructivist Grounded Theory. Not only did this entail the preparation of all the materials that had been collected (in terms of transcription or at least active listening to audio-tapes multiple times) but also thorough discussions and exchanges of the preliminary findings among both the research team members and the extended team including the teachers themselves. It should be noted that the three main practitioner-researchers were highly critical of the researchers' findings and constantly demanded breakdowns of how the findings could be transferred into practice or made more comprehensible. This inevitably posed additional challenges to the research and analysis process. The data from the interviews were manually screened for thorough discussion with the practitioner-researchers but then also coded using MaxQDA in order to facilitate collaborative coding activities. The following illustrations – with T standing for "teachers," "S" for "students," and "Pa" for "parents" – offer insights into our research process by showing a clipping of preliminarily condensed initial codes:

Figure 11.2 depicts parts of an initial order of open codes along categories. Clearly, these are still impacted on by the discussion around barriers and enablers to learning and teaching. *Teachers and student's role* as well as the impact of the *living environment* (e.g., parents) were identified as relevant. *Strengths* point toward a positive take on the teaching environment, showing readiness to engage and accepting diversity as a strength. Adequate *strategies* to enable learning for all and tackling *barriers* and lack of resources were identified as being among the relevant aspects.

After an initial sorting and alignment of the relevant categories along overarching concepts, the analysis was taken to the next level through the application of constant comparison. This implies looking into the different data sources and drawing from the ongoing exchanges with the teachers with a view to extracting core concepts. In the course of two additional interviews during the analysis process, interim findings were further discussed and developed. The following figure introduces the emerging core categories and their interrelations. On this basis, an initial theoretical foundation can be established that frames further contextualization by assessing the existing teaching and learning practices under a UDL perspective. The main concepts and categories in the analysis point to a relationship between resources, strategies, strengths, and barriers that impact on an enabling and individually oriented learning context.

The references to working with a focus on enabling and furthering *strengths* of students were strong in the data material. The aim of the teachers was to identify different approaches and abilities as strengths and to work with these accordingly. In relation to the need for a continuous focus on *strengths*, one teacher pointed out that constant reflection on what functioned well with her students (also using the Buddy Books) and her colleagues was essential. Giving students the space to reflect on what functioned well was considered to be of special relevance:

> Gerti: *It is good that we reflect on a regular basis; this enables routines. Actually, once a week we take the time to talk about the question "What are you proud of?" In my experience many of the students say, "I am proud of nothing." This makes me gasp. It says a lot about self-worth.*

Gerti stressed the importance of making the children in her classroom aware of what they are able to do and that there are many reasons for them to be proud. Specific lessons, termed "study coaching," are used to work against students' perceptions that they are incapable of succeeding and thus change how they "wander aimlessly around the world," as she described it. The teachers believe that a certain flexibility in SZD and in the specific collaborative conditions of the approaches of the teacher teams to the curriculum is essential to be able to react to students' needs without losing focus on academic outcomes. Specific lessons constituting an integral part of the lesson plan (in this case a so-called social lesson) can be used to discuss the needs of students, while others can be adapted to urgent needs. This is referred to as "emotional work" (a very specific term in German: Beziehungsarbeit) by the teachers, and is considered a specific strength of a reasonably open system

that allows for a certain degree of flexibility, but is also an indication of the heavy responsibilities the teachers have:

> Gerti: *We have a social lesson and the topic is: We are all different and that is fantastic. … It is about acknowledging diversity and wowing the students by making them think about how things are done differently depending on specific backgrounds and how fascinating that can be. … This may all sound a bit preachy, but in reality, it is our job to make children really tolerant and open to differences. … It has to do with developing cultures of conflict.*

Gerti reports how she uses time in her lesson to open a reflective space for the students where they can learn to appreciate who they are and how they differ from one another. She acknowledges this as one of the central features of her job: wowing children and investing in personality development. While this shows the relevance of focusing on the positive aspects of what teachers can do and how they can generate reflective spaces, the category *resources* refers to factors of potentially negative or impeding effects. Hanna refers to the rather broad concepts of time and space that are needed in addition to "the right kind of training of teachers." Providing individualized learning environments implies a high workload for the teachers as open and flexible learning environments ask a lot of the children. Gerti reports that some of the students take a lot of "time to get started. They don't get into the process of doing." This implies a lot of coordinated effort and time on the part of the teachers, which often results in the need to put in extra unpaid hours. Gerti also reports that some of the students need support to realize what their learning challenges are before teaching or teaching environments can be adapted. Finding the right mode of adaptation or approach to learning is described as being "resource-intensive, you have to be close and adapt the method so that children are enabled… and this keeps my mind very occupied" (Gerti). The development and application of specific *strategies* to coordinate efforts and enable learning can help in that regard. Some children need a "specific type of guidance" as "they are overwhelmed with decision making in an open learning environment," whereas other students are very clear about their decision-making process. This can be described as a balancing act that requires good coordination among the teaching teams but also reflections involving the students themselves. Discussions will center on the question "How can each student learn best?" (Gerti). Tackling *barriers to learning* as identified above is of central interest in this regard. The category refers to the specific roles that parents and students play in deciding upon the design of learning environments. This requires a certain eye-level approach which can be difficult to maintain. References to the home environment, parents, or other context factors also play an important role (see parents' section below). Gerti explains that a student's:

> "*social issues have to be known and understood to adapt the class so that they can learn well, otherwise it won't work… The students know that we expect something from them, and yes, there is some sense of seriousness which is being transferred to the students, at least in the best-case scenario.*"

With respect to providing *adequate learning environments*, Hanna points out the following: "I have the feeling that the students need a positive atmosphere, an

appreciative climate. This is first and foremost. And then there is the silence and the different channels in order to digest teaching contents."

This suggests that providing an adequate learning environment goes hand in hand with adequate teaching and learning. Quiet learning conditions are among the factors considered most relevant in the list of learning facilitators as they are closely associated to the capacity and need to concentrate. Nevertheless, the factors for an appropriate learning environment can differ depending on the individual, ranging from the need for the availability of specific tools to the requirement of a tranquil and steady environment. Gerti illustrates the diversity of needs when arguing that "many students effectively need space, an empty space with a wall in front of them, for them to stick to a task. They are flooded by other influences, which makes it really hard for them to remain focused." Finding ways to create enabling individual learning environments was identified as a core topic in the interviews.

Interestingly, the understanding of the concept of UDL was already referred to at early stage of the data collection phase with regard to finding solutions or being inspired to further investigation. Sabine described UDL as a source of orientation: "It provides answers and strategies, methods and tools to strengthen students' competences." Thus, the introduction of the concept of UDL through project collaboration seems to have had an impact. It enabled the teachers to reassess their teaching practices and further develop them through a growing awareness of what works and which aspects in relation to a specific area of teaching (as in, for example, the learning environment) need to be questioned and adapted.

One major factor that will be addressed below is related to the role of parents and additional areas of life worlds beyond the school context. With some students, the gap between the school and the home environment is large. There might be no opportunities to learn in a quiet environment at home or any support structures to help maintain or advance their knowledge. The effects of the extensive use of social media platforms and a lack of sleep are associated with low levels of self-esteem and a lack of ability to concentrate. Keeping in touch with parents sometimes can also pose a major challenge to the teachers. Asked to collect data from parents, our practitioner-researchers came back with a long list of hindrances to learning collected in different contexts of parent–teacher meetings. Again, the teachers felt that they were the ones who should collect the data as their relationship with the parents was closer and the process of getting in touch with them was easier. They also considered that direct data collection through them was a more effective way to gain insights.

Parents Some of the findings above already highlight the role of the out-of-school environment, especially in relation to the parents. More often than this aspect is missing from discussions surrounding the effectiveness of teaching and learning practices. Considering that parents are a main resource for the learning process, involving their insights seems very relevant but not easy in the context of decision-making when working with UDL. The main hindrances to learning were gathered using lists; a concept in bold again illustrates that more than one parent referred to it as being relevant (Table 11.3).

Table 11.3 Selected barriers to learning identified by parents (random order, aspects mentioned more than once in bold)

Hindrances to learning
1. Lacking Concentration
2. Language barriers
3. Dyslexia
4. Noise
5. Lacking interest
6. Lacking impulse-control
7. Lacking structure in school
8. Learning disability
9. Not interested in school, wants to work
10. Spelling
11. Structure vs. Chaos
12. Self-organization
13. Inability to learn
14. Little stamina
15. ADHD

Again, many of the concepts listed refer to inabilities or pathologies of the children: inabilities (cannot learn) and perceptions of lacking coping mechanisms (little stamina). Nevertheless, there are some aspects that refer directly to the learning environment: class climate and noise are among the factors affecting learning. Other aspects focus on the societal backgrounds of the children (impact of father, reaching one's limit, being overwhelmed, and being afraid or simply unwell). Knowledge of these contexts is relevant to the teachers' decision-making in terms of learning contexts.

What is quite striking is the language used by some of the parents to describe the abilities of their children that are lacking, which was also discussed in the data collection follow-up interviews. One of the aims of the Buddy Books is to engage parents in continuous interaction with their children and keep them informed and involved in the learning outcomes. The lack of involvement of parents is one of the main barriers identified by the teachers and therefore an issue that needs to be addressed. This aspect, which is often only regarded as a side issue (if it is mentioned at all in the context of designing successful learning environments), shows the need for further development of UDL applications in the given context.

Students' perspectives on barriers were assessed from a more positive angle by asking them to share what helps them to learn well. The two pictures below illustrate the process of data collection in two 4th grade classrooms. As these students were about to transition away from the school, their perspective proved especially interesting as they had high levels of experience with this particular school setting (Pictures 11.1 and 11.2).

Students were invited to express their ideas on aspects that enable a good learning process by writing them on the board or sharing them verbally in two workshops.

The main factors that were uncovered range from the need for a quiet environment to, contrastingly, learning best while listening to music, and from issues of motivation (being interested in the topic) to different modes of learning (with support and group work being mentioned as important). Applying the right modes and
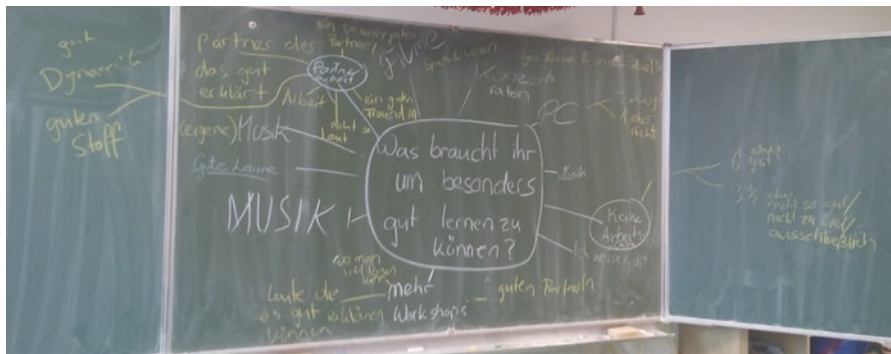
Picture 11.1 Data collection with students 1
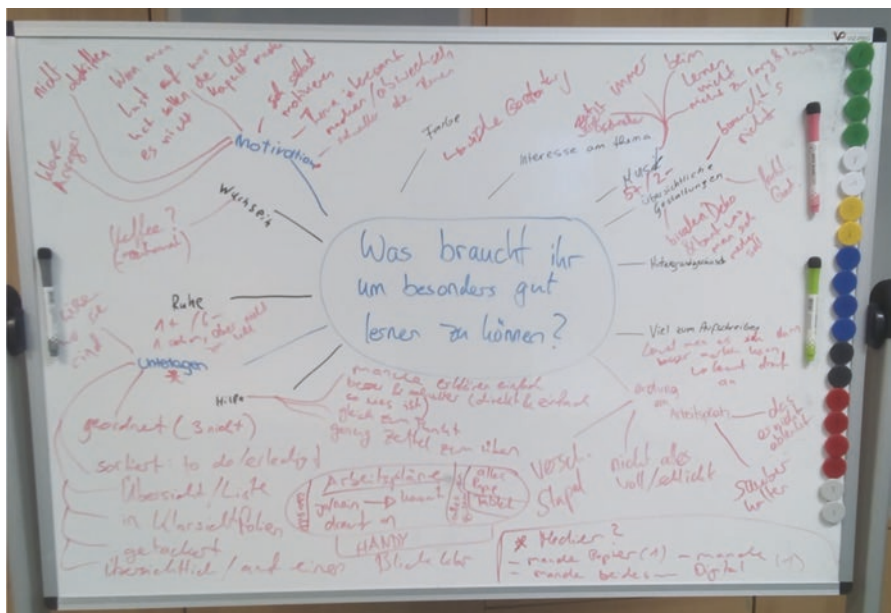
Picture 11.2 Data collection with students 2

using appropriate support material were also described as being relevant. Among others, the following were mentioned:

1. PC, cell phone.
2. Many writing exercises.
3. Organization: Lesson plans, clutter-free table, specific piles.

During the discussion with the students, it became quite obvious that reflections on learning were nothing new for them and that they seemed quite aware of what was needed. At the time of writing, further analysis into the overlap of the

implementation of UDL and children's voices is still ongoing, but points to the relevance of democratic learning. This resonates with elaborations on holistic approaches that will be described in greater detail below (see Fig. 11.6).

Results

UDL enabled the questioning as well as the enhanced development of already established teaching practices in the given research context. Indeed, the mere introduction of the concept of UDL sparked a lively debate among the team of teachers (see Fig. 11.3). Examples will be used below to elaborate on the findings of the introduction and reflection process, applying UDL as related to the research questions. Considering that this research focuses on a reassessment or reinterpretation of already existing good practices, some of these practices (which were observed and discussed with the practitioner-researchers) will be expanded on below.

In order to elaborate on *how existing practices in inclusive education can be reinterpreted under a UDL perspective*, the following two examples will now be analyzed in greater depth. These teaching practices were identified by teachers when asked to nominate the most relevant and characteristic practices at SZD and were also identified as such during the observation phases. The following sketches of classroom settings were derived from observations that took place in early November 2019 (Figs. 11.4 and 11.5):
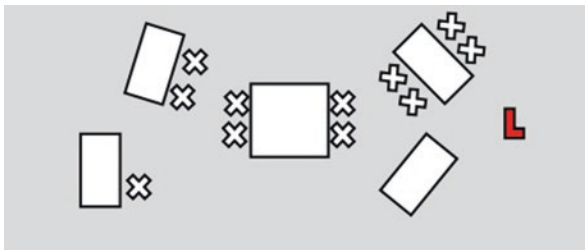
Fig. 11.4 Classroom observation, math (L marking teacher's location)
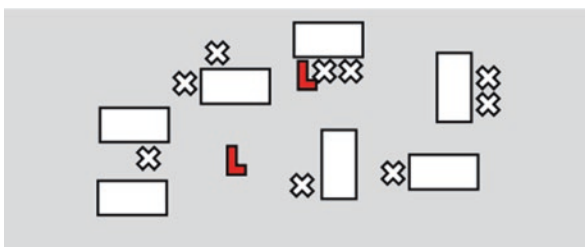

Fig. 11.5 Classroom observation, box lesson (L marking teachers' location)

Box 11.1 Box Lessons

Depending on the grade, students attend an average of two sets of box lessons each week where they go to a room called the Lernwerkstatt ("learning workshop"). The size of the room is around 50 m² and offers all manner of possibilities. From this obligatory skeleton, each school can fill the room as they desire, from endless types and colors of paper to tableware, stuffed squirrels, and loads of soap suds. In this room, students can choose from more than 230 boxes that all feature a different topic: from animal-related ones (the camel, types of cats) to more broader topics covering questions such as "Where do my jeans come from?" The topics cover a wide range of subject matters and each box has a specific layout with an overview of the materials it includes, an instructional manual, different exercises, and a piece of paper with solutions to the exercises that the children can use to track their progress and outcomes. It is up to them to choose a topic and spend the following 2 h (or even more if combined with the following week) on it. The process of arriving in the room, choosing a box, working in an autodidactic manner, and reflecting on what follows is ritualized. The lesson is opened and closed with music, and a gong is sounded to start and conclude the work phase.

Interestingly, both settings point to already alternative approaches to typical classroom settings, with the layout of the concept of box lessons underlining the fact that individual student engagement is supported by two teachers, an open setting and significant space. The concept of box lessons will be elaborated on further in Box 11.1.

Concept of Box Lessons

The concept was introduced to the school more than 10 years ago by an enlightened school head. The topics in the boxes even include chemical experiments, and can be related to animals, geography, social sciences, etc. The boxes enable the students to self-explore at their own speed. They choose a topic and do different exercises of varying complexity that can be found in the boxes. They learn autonomously and in the end present to the rest of the group what they have learned. The focus is on listening to each other and on what the students have learned by themselves. Each student and their learning become the center of attention. The students sometimes also need to leave the room in order to setup ropes that help them understand how far planets are away from the sun. Box lessons provide a safe, ordered environment which students can leave of their own free will. Collaboration with universities and the involvement of teacher trainees has led to long-standing collaborations and more than 100 boxes kindly generated by teacher trainees.

Box lessons tick several boxes of the UDL approach to providing rich learning environments: there are many different materials and different modes of how a topic can be approached and explored (see research question 2). The individual and active role that students assume in the specific setting can also be interpreted in UDL terms

as the teachers' role is transformed from guiding a learning process to enabling a learning process (see research question 3).

The idea of providing different options which children can choose from goes beyond the concept of UDL's prepared – tough flexible – environments. Next to family and other societal factors, the personal choice of children and the context of reflection on learning outcomes extends even further than the UDL concept. Reflection on learning is also of central importance in the second example described below.

The second well-established teaching practice (at least with some of the classes) at SZD that was reassessed using the findings described above and in the course of engagement with UDL concerns the previously mentioned Buddy Books which will now be explained in greater detail.

Buddy Books

This tool to help organize learning has been referred to throughout this chapter. The tool was introduced by some of the teacher teams and facilitates individual learning progress documentation and can be used to guide reflection. As with box lessons, the professional and personal involvement of teachers plays a major role in the introduction of a tool aimed at furthering individualized teaching and learning approaches (Box 11.2).

Box 11.2 Elaboration of the Planning and Learning Evaluation Tool Buddy Books

Buddy Books are intended to act as individual learning guides and to be shaped and created by the students themselves. They are used to document learning progresses but also to enhance competencies in social skills and in taking on responsibility for one's own learning. In the beginning, students are asked to create an individual profile and to reflect on themselves as learners. Additionally, individual learning goals for the upcoming term have to be defined. Subsequently, individual progress is documented by the children themselves without being assessed. Weekly sheets help to set small and feasible targets and milestones; progress is reflected on at the end of each week and in summary at the end of each term. The aim of this approach is for students to learn to take on responsibility for their own progress by setting their own goals and documenting their own efforts. But students are not the only ones who fill the pages of their Buddy Books: parents and teachers also contribute to each student's individual progress by recording their support for reaching learning goals. Like the students themselves, they are asked to focus on positive aspects only and to refrain from deficiency orientation. Social skills are represented by mapping the most and least liked activities with classmates, by reflecting on their learning environments, and by asking for support to reach their individual goals.

Importantly, this tool enables a reflective view on one's own learning process. By contrasting the students' own perspective and those of their peers, parents, and teachers, it enables stakeholders to keep track of developments, but it is mainly regulated by the students themselves. This process of taking a step back and reflecting on one's own learning progress is described as being a very important part of SZD's learning and teaching approach. Besides being a practical tool, the Buddy Book helps to structure learning processes.

The two examples described above were introduced into the school through the personal motivation of teachers and through an exchange of information with other schools and external teacher colleagues. The first boxes were created by the teachers in their spare time, while the Buddy Books were adapted from a learning trip to another school in Germany. The Buddy Books were introduced through a teacher exchange activity, while the concept of box lessons was also witnessed in another school context and introduced by one of the former heads of the school. In one of the interviews, one of the teachers refers to them as practices that "WE made," emphasizing the school community's joint efforts and localized urgency for suitable developments and the constant introduction of new ideas. Their ideas and further interpretations stem from the knowledge they have of their students and the specific school context, which seem essential in guaranteeing the sustainable implementation of innovative practices.

With respect to the research question *"How can UDL enrich these existing practices,"* the teachers pointed to the fact that it offers tools to broaden individualized offers and reflect on their use. Gerti highlighted this when saying that "UDL offers support to choose methods." It is perceived as an attitude and thus aligned in the center of Fig. 11.3. The practitioner-researchers pointed to the fact that there is "a lot of materials and methods. We don't have to reinvent the wheel" (Gerti).

Thus, the broadening and extension of individual teaching practices through UDL is acknowledged by the teachers, while the choice of tools and the constant reassessment of the specific needs of the students in a given context needs to be considered carefully. The specific teaching practices are embedded in a historically grown context of developments from special education to inclusive education (see section "History and Present of the Austrian Education System with a Focus on Schooling for Children with Special Educational Needs and a (Forced) Migratory Background"). These developments (coupled with the high levels of involvement of teachers and SZDs' autonomous interpretation of approaches to learning) reveal the importance of considering localized teaching practices and the relevance of participatory approaches in their further development.

The use of contrasting perspectives helped to highlight the fact that the teaching practices used as examples above (box lessons and Buddy Books) promote a high level of student autonomy. The children base their choice of learning content on personal interests and preferences. Additionally, to a certain degree their reflections on their learning progress are guided (or even regulated) through the frequent use of documentation.

Further aspects of importance that can be derived from the findings obtained when discussing and contrasting the approaches include the following:

1. Blind spots: Additional actors and living environments, importance of consider-
   ing parents and students' voices

As has been already hinted at, one of the main restrictions identified in relation to
UDL is the absence of a reference to the individual background of each student. The
choice of a specific didactic tool is therefore not only shaped by the specific type of
learner but also by their homelife conditions. As discussed above, these often differ
considerably from the educational environment found at school. Navigating the dif-
ferences between these lived realities requires contextual knowledge on the part of
the teachers, as well as "emotional work." Dealing with students that are afraid of
going to school or being made fun of by other students indicates a need that extends
far beyond choosing from a set of pre-determined modifications to the environment
depending on a specific learning type. The idea of enabling students to choose, self-
organize, and reflect on their learning seems to be outside the sphere of UDL.

2. Enabling individual learning contexts and goal orientation

Taking the findings of the Participatory Research approach into consideration,
the main points of reference (identification of barriers, leaning toward strengths,
talking about missing resources, and reassessing strategies) are configured in the
major goal of shaping the appropriate facilitation of individualized learning envi-
ronments that consider the child and its environment as a whole. Using this as a
point of orientation among the teams of teachers and in shaping learning environ-
ments that suit all individual needs in the restricted environments of the school can
be considered helpful. The question as to how each child's needs can be met without
negatively impacting on the needs of others is an ongoing topic of debate at
SZD. Didactic concepts, tools and methodologies are referred to and adapted in
accordance with this goal. Hanna summarizes this when saying: "Diversified teach-
ing methods that are orientated along learners' needs allow the learning goal to be
reached by all children."

3. UDL as – more than – an attitude

Interestingly, the reflections on the concept of UDL quickly showed that the
teachers we collaborated with chose specific aspects from the concept as they
understood it and applied them to broaden their idea of what facilitation of learning
environments meant.
   In later stages of the analysis process, the teachers were invited to share their per-
sonal interpretations of UDL. More often than not the collaborating teachers stressed
that attitudes need to be considered and constantly worked on. Among the main feed-
backs provided by the teachers (in relation to the process of approaching UDL and
considering its potential for furthering well-established practices) were the need to
collaboratively share in the realization of inclusion and in the engagement of a spe-
cific approach for that purpose. The following are highlights of the answers given by
the three collaborating teachers when they were asked what UDL meant to them:

> Gerti: *UDL is an approach to create accessible environments that should enable suitable
> learning conditions for all learners. UDL provides a possible answer and provides strate-*

gies, methods, and tools to strengthen the competences of students. This approach facilitates reflection on teaching goals and their adaption to enable successful learning.

Sabine referred to UDL's potential to "support each student at their specific stage." The importance of individual decision-making and the responsibility of students for their own learning was emphasized and described as having an impact on the assortment and choice of preferred learning tools. The focus on strengths and the need for constant reflection with students and colleagues was also stressed. Students are assigned a vital role in the decision-making process of what kind of learning environments are provided. So, they are not only provided with support to become more self-aware and conscious decision-makers in terms of how they wish to learn and organize themselves, but they themselves are also involved in what is provided in the first place. Gerti summarized this as follows: "At the core lies the self-regulated responsibility of students for their learning and the provision of learning tools." This extends beyond the UDL idea of providing for specific learning types, as the students appear as actors who actively take part in shaping the discourse of the provision of proper learning environments. The need for differentiation when planning a lesson was highlighted when Gerti remarked: "The orientation toward strengthening children helps to differentiate aim, content and method." Hanna pointed out the need to "understand the levels of diversity of each child" by getting to know each child well and by continuing to reflect with them in order to provide an adequate learning environment. Her approach to a specific topic was shaped by the following: "By considering the individual peculiarities of each child, they experience my mindfulness which again sparks their self-organized learning." This process is fueled through: "ongoing reflection with the children which is how I learn to consider their strengths and what poses barriers to their learning." This posits a possible answer to the research question related to how practices can be developed to become more child-centered.

The above also shows that the reflection processes that arose as a result of this research project served not only to generate ideas as to how best to provide appropriate learning environments. These reflection processes also contributed to strengthening or at the very least reviving the communication between teachers and students. This aspect is expanded upon in the following section, which embeds the findings of the study in the broader context of understanding how the introduction of UDL principles has sparked an ongoing discourse in the context of school development with respect to which principles can be taken advantage of to enable the localized implementation of more sustainable school development practices in order to further inclusive education practices.

Discussion of Findings and Conclusions

With reference to the research questions posed at the beginning, it can be reported that the process around a possible implementation of UDL to further school-based practices sparked a broader discourse which highlighted the relevance of ongoing

reflection processes involving students, parents, and teachers, considerations of the living environments of children and the need to acknowledge their role in actively shaping the provision of teaching and learning environments beyond pre-determined learning types, and the stimulation of specific areas of the brain through predetermined sets of tools.

Taking into consideration that no educational approach is without a scientific or attitudinal context, it should be noted that the different approaches to providing a conducive learning environment, with their specific strengths and weaknesses, can be interpreted along a spectrum that enables a reference point for ongoing reflection on furthering a more child-centered localized approach to teaching and learning.

With respect to the contrast between UDL and existing teaching practices at SZD, which can be referred to as individualized or differentiated instruction (DI), further desk research into already existing perspectives on these two approaches has been conducted (Ralabate, 2014; Griful-Freixenet et al., 2020). Ralabate (2014, 8) stresses that UDL caters for specific predictable contexts, whereas DI can be considered as catering more toward the individual in promoting responses to specific needs:

> "*A key contrast between DI and UDL is that DI emphasizes responding to individual needs, whereas UDL emphasizes proactive design of environment and instruction based on predictable, systematic learner variability.*"

The fusion of the two approaches proved helpful in selecting, reassessing, and thus developing specific approaches to teaching and learning at SZD. Drawing from the strengths of these and additional approaches to didactics, learning, and teaching enables a holistic toolbox for the development of specific individual (or at least local) approaches to child-centered learning environments. If SZD's approaches to providing learning are included along a spectrum which includes UDL and DI (Fig. 11.6), the relevance of contexts beyond the individual as well as the need to refer to the reflective power and involvement in decision-making of the students themselves can be incorporated.

The interrelatedness or distinction of UDL in contrast to other established approaches to didactics need to be studied further in order to broaden its understanding and its benefits in specific localized contexts.

Additional factors that need to be addressed in reference to findings from the Participatory Action research include the following:

1. Making UDL more relatable

The teachers articulated a need to be provided with a comprehensible and digestible interpretation and translation of the complex concept of UDL in order to be able to apply it in their daily teaching context without having to spend an excessive amount of time analyzing it themselves. This suggests that findings in the context of individualized instruction and the provision of adequate learning environments in the context of inclusion need to be further elaborated on and transferred into practice. Understanding UDL in CAST's interpretation demands a lot of advance knowledge. Some terms and contexts are hard to grasp for people who are not accustomed to an academic context.

	UDL	DI	SZD
Prerequisite	Design of learning environment	Response to individual	Holistic perspective (beyond specific environment)
Goal of instruction	Instruction < > predictable, systematic learner variability 🙂🙂 < > 😌😌	Individual (learning) needs < 🙂 >	Child/child's environment 🙂
Stance	Proactive	Responsive	Spontaneous and based on localized context and circumstances of the child

Fig. 11.6 Spectrum of approaches to learners and learning environments

2. Team effort

"It is important to recognize that both within the core group and the wider group of colleagues involved there were potential tensions and dilemmas, similar to those referred to by Elliot (1991) as 'a clash of professional values' between traditional pedagogy and reflective practice." (Simpson, 2019, 66) This quote highlights the fact that in the course of this research it became clear that not all members of the school community were in favor of the research efforts and were not really interested in learning about a new approach to shaping learning environments. As previously mentioned, the mere act of engaging in a reflective discourse as such seems to have had some impact on questions related to the new direction the school is taking, and this in itself can be considered highly promising. Nevertheless, it also shows that the introduction of new approaches to teaching are best embedded in collaborative research or at least developmental processes in order to enable sustainable change.

3. Personal engagement

It should also be strongly underlined that the willingness to engage on the part of the three collaborating teachers has been truly remarkable. Considering that their own teaching practices were being assessed, such an eagerness to take on board critical reflections on these practices, albeit for their further development, does not seem very common. Ongoing support and questioning, as well as the desire to gain insights and shape the research process, are key to a properly functioning research process aimed at changing teaching practices and the way they are being researched (Armstrong & Tsovoka, 2019). Similar respect is also due to the teacher trainees who were involved in the project. Despite a rather critical position regarding UDL among teacher trainees in the area of inclusive education due to its links to

neuropedagogy and overlaps with individualized instruction (Inklusive Didaktik), they proved eager to engage in supporting the realization of inclusive education. The collaborating school also reported that it welcomed the support from the teacher trainees and the opportunity to receive guidance on how best to reflect on their teaching practices and observe examples from other countries. Likewise, the researchers appreciated the opportunity that was afforded them to work at eye level with a partner school and develop user-oriented solutions. Similar project-related opportunities for teacher trainees with respect to in-service training should be emphasized in teacher training programs.

The same holds true for the implementation of sustainable new approaches to teaching and learning at school. It seems to be essential that teachers who are involved in and knowledgeable about the respective contexts become more engaged in introducing and bringing these processes to fruition.

4. Localized practices

The need to consider localized contexts as being relevant and important has already been mentioned. Additionally, in the case of SZD, what was helpful was a specific flexibility with the curriculum which can be considered as a framework (German: Rahmenlehrplan). This implies that by the end of a particular school year specific teaching and learning goals have to be reached or topics touched upon regardless of the exact timeline and approach. Subjects can be renamed in the specific school context. This allows flexibility on the part of the teachers to focus on, for example, job coaching, social skills, etc., should the need arise. This also enables a context to discuss problems with students as and when they occur. In turn, this underlines the importance of personal engagement and the contextualization of national school system structures or even specific schools when implementing teaching approaches.

The goal behind our study was to promote (more) child-centered and therefore inclusive education and to act as catalysts toward change at SZD. This goal was developed in a joint process of the participatory research team, with teachers from SZD playing a leading role in defining the aims of the study. As previously described in the methodology and methods section, our study, according to the chosen (Critical) Participatory Action research approach, can and should be considered as political, meaning that it was not value-free in the sense that it was constantly concerned with the interests of all the actors at SZD (Armstrong & Moore, 2019). All the research questions were codeveloped by the practitioner-researchers; the primary driving force behind the research process was the interest of the teachers themselves in researching their own practices (see Kemmis et al., 2014). Our goal was to collectively change the particular social world of and at SZD by "thinking about it differently, acting differently, and relating to one another differently – by constructing other practice architectures to enable and constrain their practice in ways that are more rational (in the sense of reasonable), more productive, and more just and inclusive" (ibid, 17). And this is what we tried to do. We would like to end on a hopeful, visionary note as expressed by one of the collaborating teachers:

Sabine: *Inclusion is an attitude that needs to be filled with life. If this is the case, the orientation of the institution will automatically follow.*

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Chapter 12
The Model of UDL Implementation Enabling the Development of Inclusive Education in Different Educational Contexts: Conclusions

Alvyra Galkienė and **Ona Monkevičienė**

Abstract This chapter presents the conclusions of research carried out by Polish, Lithuanian, Finnish, and Austrian researchers, aimed at providing an answer to the question of 'How the implementation of Universal Design for Learning (UDL) enriches the practices of inclusive education in different educational contexts.' The summary of the research results is followed by a model of the application of the UDL approach for the development of inclusive education. In the model, the UDL approach is presented as an approach of transforming the process of education and strengthening teacher inclusive attitudes, as a prerequisite for the pupil's becoming an expert learner, a means for mobilizing the school community, a tool for reflecting teacher competences, and a new perspective for re-interpreting educational practices. The UDL application model is valuable in terms of developing inclusive education practices, as it allows us to see barriers to pupil education as well as relevant directions for improving education in any educational and cultural context.

Keywords Inclusive education · UDL · Education transformation · Education re-interpretation

The research, which was conducted in four European countries, aimed to reveal the impact of the application of Universal Design for Learning (UDL) for the improvement and re-interpretation of inclusive education in different educational contexts. The research project was implemented in different educational contexts and schools with different experiences in inclusive education. The discourse of the project partners disclosed national priorities for inclusive education implementation, which influence teachers' dispositions and educational practice at school. Taking into account the priorities of inclusive education improvement, the areas that are relevant

A. Galkienė (✉) · O. Monkevičienė
Educational Academy, Vytautas Magnus University, Kaunas, Lithuania
e-mail: alvyra.galkiene@vdu.lt; ona.monkeviciene@vdu.lt

to the analysis and improvement were distinguished in the discussions of researchers and teachers–practitioners. The Polish research team identified the problem of improving the process of inclusive education in the classroom. The Lithuanian researchers put forward the idea of developing the pupil's becoming an expert learner in the context of inclusive education. The discussion about the improvement of a well-developed system of inclusive education in Finland raised the problem of developing the inclusive competence of teachers. The Austrian researchers emphasised the need to re-interpret the existing high-quality practices of inclusive education from a different perspective, identifying relevant aspects to be improved. Having discussed possible ways to improve inclusive education as a tool of change in inclusive education, the UDL approach was chosen. Scientific research attempts were made not only to improve inclusive education in schools, revealing the peculiarities of UDL application in different cultural educational contexts, but also to identify and ground on research new possibilities of UDL application. The action research was chosen as a methodological approach that allows changing the educational practice and simultaneously developing the theory.

Following the results of research on different cultural educational contexts, a model for applying the UDL approach to improve inclusive education was designed (Fig. 12.1).

UDL as an Approach to Transforming the Process of Education The research results revealed a multi-stage mechanism of change in the process of education in the classroom and school following the USL approach. The results prove that the application of the UDL approach helps to transition from routine, learning-difficulty-centred teaching to flexible, self-regulating, reflective teacher-moderated learning that is grounded on collaboration of pupils, teachers, and parents and emphasises coping with barriers. The teachers from all the countries in the research, except Finland, doubted the efficiency of applying the UDL approach to the improvement of inclusive education, although the teachers tended to support the introduction of research-based changes at school. Tutoring of researchers initiated and supported the application of the UDL approach in Poland, and it was less and less needed in the process of the action research strategy. In the process of tutoring, teachers were provided with knowledge of UDL, strategies for UDL implementation were modelled, teachers were encouraged and consulted, and their self-assessment was promoted. The observed positive results, such as increasing pupils' motivation, pupils' engagement and growing collaboration abilities, enhanced the self-confidence of teachers and their belief in the efficiency of the UDL approach in the process of action research. Regular discussions with the researchers after the observed lessons, when specific stages in organising education and ways of solving emerging problems were modelled together, enhanced the Lithuanian teachers' attitudes and abilities to apply the UDL. The observed abilities of expert learners, which revealed themselves among pupils even without SEN, promoted a breakthrough in the teachers' attitudes and increased their motivation to apply the UDL approach. The Austrian teachers in the research raised the problem that the UDL guidelines and other related materials should be translated and adapted to the country's context,
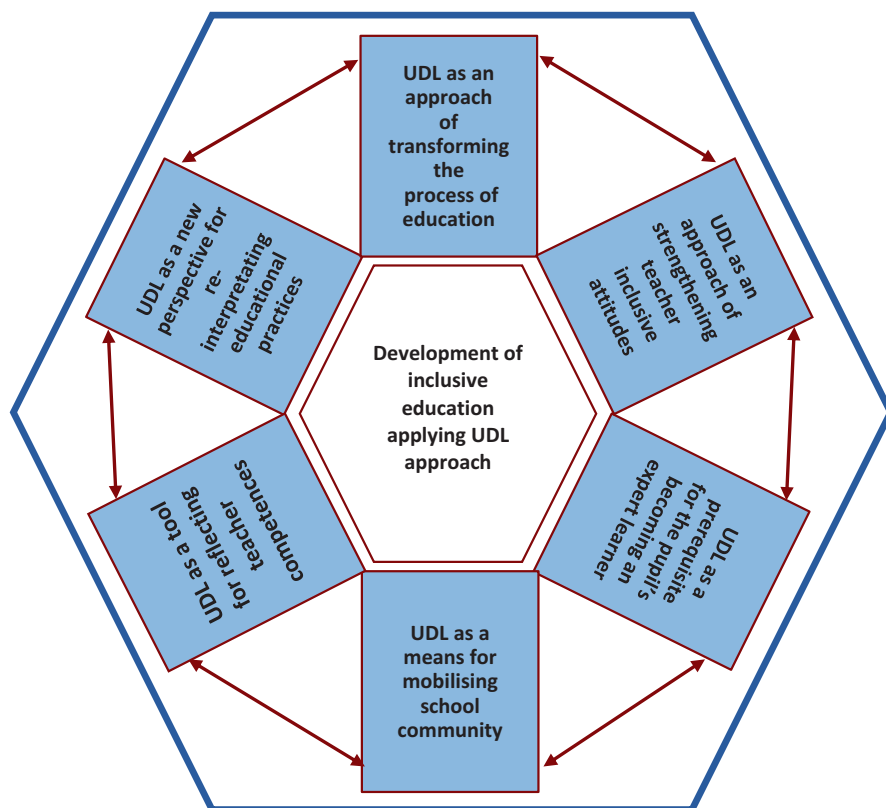
Fig. 12.1 Model for applying the UDL approach while developing inclusive education

choosing the equivalents of the concepts used in this country. This would help them achieve better understanding, would save teachers' time, and would increase the convenience of practical application.

The research conducted in the Polish school disclosed that the application of the UDL approach enables teachers to move from the status quo situation when other factors are not efficient. It was established that even when pupils and teachers felt a need to change and had ideas about how to do this, they were stopped by disbelief about the success of possible changes. Application of the UDL approach enabled teachers to begin the process of changes. It was also established that the mastered application of the UDL approach becomes a tool for easy coping with the most unexpected challenges to education organisation. The action research conducted in the Polish school showed that teachers and learners who had previous experience in implementing the UDL approach successfully eliminated distance learning challenges during the Covid-19 pandemic. Motivation and responsibility of pupils and teachers to use distance learning opportunities strengthened, pupils' autonomy as well as creativity increased, and problem-solving abilities improved. Applying the

UDL approach to distance learning led to an unexpected result—to closer collaboration of teachers, pupils, and parents that stimulated a more active engagement of pupils in the process of learning.

UDL as an Approach of Strengthening Teacher Inclusive Attitudes The action research revealed that the teachers' ability to doubt the existing practices, to question and explore them, encourages the improvement of inclusive education practices. The enhancement of teachers' inclusive attitudes was promoted by international collaboration among schools in the participating countries, and this allowed for seeing practical examples of organising inclusive education. School teachers–researchers had an opportunity to act with university researchers on an equal basis while making practice-oriented decisions.

Despite the fact that in the beginning of the project the whole research team (teachers and researchers) together with UDL strategists discussed and analysed the conception, principles, and practices of this approach, in the beginning of action research every teacher possessed own interpretations of the UDL approach, which were successfully conformed through collaboration and constant reflection.

A relevant aspect in the change in teachers' attitudes towards the process of education was revealed. In Lithuania, where the understanding of a class as a homogenous unit traditionally prevails, teachers have started seeing every pupil in the general context of the class. In Finland, where children are provided with substantial individual support, teachers have started including children with severe special needs in the joint learning process in the classroom. In the Austrian school, a question regarding combining individualised and common environment targeting the same goal remained significant.

UDL Is a Prerequisite for the Pupil's Becoming an Expert Learner The difference between the goals of the UDL approach and those of traditional education striving for the quality of inclusive education is an obvious focus on the education and development of all pupils as expert learners. Application of this approach revealed the processes and factors of pupils' becoming purposeful and motivated, resourceful and knowledgeable, and strategic and goal-directed. The action research showed that the purposefulness of the process of education, which is ensured by the UDL principles, areas of their implementation, and checkpoints, significantly contributes to the development of the pupil's abilities of expert learner. The rate of pupil's becoming expert learners depends on several factors: (a) the depth of understanding the UDL approach and the quality of modelling practices of inclusive education; (b) the compatibility of priorities of education system and UDL principles; and (c) the teacher's belief in the potential of all learners, including those with SEN, to develop the abilities of expert learners.

The action research in the Lithuanian school showed that before the start of the research project, some doubts about the possibilities of applying the UDL approach and disbelief in the powers of certain pupils to become expert learners impeded the identification of barriers and modelling of efficient practices. The situation changed due to constant reflection of the education process directed towards development of qualities and abilities of expert learners, reflections, and identification of some signs

of pupils' success. Achievements were higher in the areas of developing the qualities and abilities of expert learners, which were reflected more actively. Better results were observed in perception of information, use of language and symbols, comprehension, interest, participation, collaboration, search for alternatives and support, meeting goals, and different ways to demonstrate knowledge. Teachers encountered more difficulties reflecting on educational practices and faced more barriers in the areas related to setting personal goals of pupils within the context of common goal, choosing strategies for attainment of goal, as well as in self-assessment of results, self-directed, self-regulated, and reflective learning.

In the context of education systems, differences in developing the qualities and abilities of learning experts emerged. Setting goals following the UDL approach, when the pupil establishes the goal from his or her own perspective in the general process of education, was less expressed in the countries where the action research was carried out in the context of traditional education (Lithuania, Poland). The peculiarities of educational contexts either burdened or facilitated reflection on one's own educational goals and achieved results. Since pupil's reflecting is still regarded only as feedback on pupil's achievements to the teacher in the Lithuanian system of education, slower changes occurred in this particular area in the school that participated in the action research. Reflection on one's own learning is a natural process. Therefore, while improving the quality of inclusive education, the school teachers not only encouraged pupils to reflect on their own learning but also taught them ways of self-evaluation and reflection, which corresponded to their cognitive development. The Austrian teachers used 'Buddy Books,' where pupils reflected on their learning process. This means was also used to document individual learning progress and reflection on it. The contexts of education influenced the pupils' ability to choose different and personally favourable ways to demonstrate achievements. In Lithuania and Poland, where teachers feel the necessity of focusing on pupils' preparation for national and international tests, the development of learners' abilities to strategy their own ways of knowledge demonstration was obstructed.

The action research conducted in the Lithuanian school resulted in the revelation of the new abilities of expert learners among pupils, which were less highlighted within the UDL approach. The pupils' ability to understand how emotions support thinking in the processes of perception and behaviour management was disclosed. This ability is better developed in the favourable emotional learning background, which weakens the pupil's motivation to withdraw from the process of education after encountering certain barriers. The pupil's ability to participate in the process of creating collective comprehension while collaborating in the learning group was one more ability of pupils as expert learners, which was less emphasised in the UDL guidelines but was strongly expressed during the process of action research conducted in the Lithuanian school. The development of this ability was encouraged by the use of cognitive tools, which help to exchange, evaluate, and systemise information, envisaging 'blind' information fields and making endeavours to fill them in. The action research in the Austrian school showed that the reflection of pupils together with teachers on how the former understand their strengths and learning as

well as encountered difficulties encourage learners to become co-creators of a universal learning environment.

The research results obtained in the Finnish school actualised the importance of developing social relations and skills while aiming at improving the quality of inclusive education. In a targeted way, the school teachers taught pupils at their personal level to work together in the group, to maintain positive relations, to reflect on personal and joint learning experiences, and to perceive and reflect on themselves as interacting with the environment. Learning of these skills was promoted, creating conditions for peer learning, that is, for self-evaluation of own experiences, discussing them, and hearing self-evaluation of others.

In the course of action research, the efficiency of certain specific educational methods (previously used in schools or discovered anew in digital environments) for the implementation of UDL principles while striving for enhancement of pupils' self-directed learning was established. For example, 'Box lessons', a method used in the Austrian school, enhances pupils' self-directed learning due to its well-prepared materials. The pupils are provided with instructions for action, materials for activities, and self-directed control of solutions. The Lithuanian teacher of English found 'Live Worksheets' online, which is adapted to self-assessment of conducted work, search for mistakes and their correction until the results, which satisfy the pupil, are achieved.

UDL as a Means for Mobilising School Community The action research in Austrian, Lithuanian, and Polish schools following the new UDL approach for improvement of inclusive education allows stating that introduction of new approaches generates tension in school communities and leads to certain conflicts with traditional values. Although some teachers tended to apply the UDL approach with enthusiasm, others demonstrated certain caution. The research also shows that a sustainable way of consolidating changes includes collaborative research, constant discussions with researchers, and tutoring.

UDL as a Tool for Reflecting Teacher Competences Striving for the quality of inclusive education, it is important for teachers to constantly engage in the improvement of competences that are of significance while organising inclusive education. The action research revealed that the UDL approach can be applied as a tool for reflecting teacher competences.

It was established that UDL implementation to pursue improvement of inclusive education, when the teacher simultaneously reflects on the needed competences, efficiently stimulates transformations in practices and dispositions. The action research disclosed that the application of the UDL approach introduced changes in organising education for pupils with severe educational needs. Before the research, such pupils were grouped into homogenous groups according to their learning needs. After the UDL approach was applied, teachers discovered new methods of composing heterogenous groups. Thus, the conditions within the group were created for gifted learners and pupils with severe educational needs to choose different ways of learning and knowledge construction using peer scaffolding. Reflection on

one's own educational process and the attitude towards possibilities of collaboration among extremely diverse pupils contributed to the changes in the organisation of learning. While using the UDL approach, reflecting on their own attitudes and competences, the teachers created methods of education organisation that enable pupils with very high special needs to participate in the general process of education together with other learners. For example, the possibility of allocating all the learning time or part of the time to common learning experience emerges; when learning assignments are more adapted and specified, more detailed stages for all pupils in the context of general learning are established.

The action research in the Finnish school highlighted the substantial benefit of collaboration among teachers, specialists, parents, and caregivers to inclusive education. According to the researchers, this aspect calls for more elaboration in the recommendations for implementing the UDL approach and guidelines. This would increase the efficiency of the UDL approach, including children with high special needs in the general process of education; as such, children are very frequently excluded due to segregational practices of teachers and lack of scaffolding. The research results in the Austrian school stress the need to devote just as much attention to strengthening links with pupils' environments outside school boundaries as it is allocated to the creation of an educational environment at school. However, according to the research data, the UDL approach encourages constant discourse among pupils, teachers, and parents for the sustainable development of inclusive schools. The research conducted in the Austrian school emphasises the necessity of supplementing the UDL guidelines with recommendations for their implementation, which focus on increased engagement of parents in the process of their children's education because collaboration and support from parents is seen as one of the key factors of a favourable socio-emotional environment.

UDL as a New Perspective for Re-interpretating Educational Practices The UDL approach can be applied for re-interpretation of already existing practices of inclusive education, which makes it possible to approach these practices from the new perspective. The research conducted in the Austrian school revealed that the construct of the UDL approach is valuable for re-interpretation of problems raised at school by teachers, pupils, and parents, as well as for finding solutions to them. In the course of this process, the significance of the interaction of resources, strategies, strengths, and barriers in creating the learning context that empowers the pupil was highlighted. The UDL ideas encouraged teachers to put emphasis on the search for ways to enhance learning success and to focus on pupils' strengths and the emotional context of learning. The UDL approach also gave sense to reflections on the problem of balancing the successful functioning of all learners in a common open environment while searching for practical solutions. After teachers and pupils engage in reflections on the coordinated functioning of an individual pupil and groups of pupils, the issues related to the development of functioning environments, the establishment of new environments, and the rejection of inefficient elements are more successfully reflected on.

The use of the UDL approach for re-interpretation of existing practices enables teachers to test practices that comply with the UDL principles and lead pupils to knowledge of the learning process and its management. The action research showed that the UDL approach helps to reflect on the already-used means and methods in a targeted way and thus puts emphasis on encouraging successful and self-directed learning of all pupils and each pupil individually.

The action research conducted in the Austrian school collates two perspectives—differentiated instructing and proactive creation of environment within the UDL approach, which is based on predictability of the diversity of pupils' peculiarities. The researchers arrived at the conclusion that those perspectives are compatible and supplement each other when an educational environment that is favourable to all is created.

The action research conducted in the Finnish school compared the perspectives of national teacher competences in MAP and those within the UDL approach. It was identified that the cognitive competence of teachers, which is included in the MAP model, resonates with the UDL principle "Provide multiple means of engagement" because it complies with the teacher's reflection on own teaching organised within the diversity of pupils and the development of pupils' skills to engage in the process of learning. Moreover, the teacher's social and communication skills and personal orientations provided for in MAP help to consider the voices of pupils and ensure their well-being and successful learning. The competences referred to as 'knowledge base for teaching and learning' and 'cognitive thinking skills', which are included in MAP, are important to the UDL principle 'Provide multiple means of representation'. Possession of these competences enables teachers to freely model the content and process of education, to foresee different ways of presenting information, taking into account different needs of learners, to apply efficient ways of class management, and to assist pupils in mastering self-directed learning and abilities of learning to learn.

Reflection of functioning practices of inclusive education in the context of UDL allows for identifying the directions and components that are of significance to the development of inclusive education in any educational cultural context. The fact that the results acquired in the countries with different experiences revealed similar tendencies even when the UDL was analysed from different perspectives proves it to be an efficient, universal tool for modelling inclusive culture, teacher's dispositions, and didactic principles. Successful creation of the holistic model for applying the UDL approach was predetermined by engagement and joint efforts of teams of teachers and researchers from different countries who acted in different educational cultural contexts but jointly matured theoretical insights based on practical activities, modelling, and testing of innovative aspects.

International Collaborative Action Research as a Driver for Sustainable Transformation In the research we carried out, international collaborative action research emerged as an efficient way to plan, implement, and reflect on systemic changes covering not only alterations to existing inclusive education practices and

structures in different educational and cultural contexts but also as joint reflections on the processes of change by the researchers in teams from different countries.

Based on the retrospective reflections of the researchers, the joint implementation of the collaborative action research provided conditions to review the national state policies and inclusive education development directions and goals in the context of the education policies and practices of other countries. Sharing deliberations, research results, and practical experience revealed profound insights; for example, even in the same European legal context, where countries set similar goals for inclusive education development, specific inclusive education practices differ greatly as a result of varying historical and cultural contexts of the education systems and the challenges that individual schools face. Taking that into consideration, the goals of the collaborative action research jointly carried out by Poland, Lithuania, Finland, and Austria were set, taking into account the future prospects in the development of inclusive education in each country and their specific challenges and expectations. The researchers, referring to successful inclusive practices in various education systems, engaged in a more thorough analysis and interpretation of the perception of inclusive education, thus developing a more open approach towards the variety of students and the process of their education. The Polish researchers and pedagogues emphasised the following: '*Because of the new experiences we have begun to see much more that student diversity is a value, which in turn has convinced us even more that inclusion is the right direction for change in education*' (from the reflections of the researcher team).

The experiences of the countries participating in the research showed that when developing inclusive education, the UDL approach must be applied in a flexible manner, taking into consideration the inclusive education practices of specific countries. Already, the first discussions of the researchers with the UDL designers and strategists during the training provided by the specialists of the CAST organization revealed that the Austrian inclusive education practice applies most of the elements of the UDL approach, whereas the Polish and Lithuanian researchers and pedagogues saw the possibility of applying the UDL approach for a more targeted inclusive education practices. The team of Finnish researchers saw the possibility of employing the UDL approach to implement a relevant national goal, namely, developing inclusive teacher competencies. In the opinion of the Lithuanian researchers, the international collaboration confirmed that, with a common direction for change, various courses of movement towards inclusion for all are possible in different educational and cultural contexts. The Austrian researchers noted the value of joining international efforts in pursuing inclusion for all: '*It was interesting to see how one goal – inclusion for all – shaped our efforts. Learning about different ways to implement and how to deal with barriers towards realising inclusion can guide and inform future research efforts, also on a global scale*' (from the reflections of the researcher team). Austrian researchers and pedagogues saw ideas of how big change can be initiated in the school system in the experiences of Poland, Lithuania, and Finland.

The cooperation between the universities and schools in the four countries, joint discussions, and school visits helped the school teachers to identify barriers in the

inclusive education practices of their own schools and classrooms. It raised motivation and helped develop ideas by overcoming challenges and cultivating resilience. The Lithuanian teachers took idea of well-coordinated teamwork from the Finnish school, which helps ensure the success of inclusive education. According to the teachers from the Austrian school, the teaching process is similar in different education systems, yet what is inspiring is the personal relationships the teachers nurture with the children, through which the students receive the strongest possible support. The Finnish teachers focused on the differing inclusive school culture in the countries, its meaning for the atmosphere in the school community, and its confidence in their activities: '*As teachers from Northern Finland from a little village, we appreciate that our work is seen as so important*' (from the reflections of the researcher team).

The collaboration of researchers and teachers when implementing the action research helped the teachers to understand their own practices more deeply, and to the researchers, it revealed the meaning and significance of the daily educational decisions of the teachers in reaching important change. The Finnish teachers especially underlined the possibility of taking a fresh look at the unity of research and practice: '*Working with the researchers has given us a possibility to see how study and practice can go hand in hand*' (from the reflections of the researcher team). The reflections of the Austrian and Lithuanian teachers revealed the practical value this unity carries of providing a deeper meaning to daily educational actions in the theoretical context. As the researchers participated in the daily life of the schools, new insights were born regarding the school realities, barriers to the students' progress and success, and the needs of the teachers, as ideas for improving work with university students and carrying out future research. The researchers found inspiration in the experiences of the Polish and Lithuanian teachers, showing how they succeeded in managing the processes of double transformation by applying the UDL: to change teaching practices towards inclusion for all and, at the same time, to overcome the barriers of distance learning, turning challenges into success stories.

The results of the research carried out, the joint work experiences of the teachers and researchers, and the changes that took place in school practices encourage further dissemination in the countries' education systems, initiate political decisions of education policymakers, and suggest various ways for UDL application on a global scale to improve inclusive education quality in different educational and cultural contexts. The personal experiences of research participants is a field of ideas valuable for inclusion, which will be expanded into educational micro- and macro-environments through the following professional connections: teacher–teacher, teacher–researcher, and researcher–researcher. The collaboration practices between researchers and teachers that were discovered in the international context ensure the sustainability of the ideas of inclusion as a continuous journey towards its higher quality.