

# Cutting-Edge Innovations in Teaching, Leadership, Technology, and Assessment

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# Table of Contents

Foreword .....	xvii
<b>Preface: Charting the Course – A Journey into Educational Innovation and Excellence</b> .....	xviii
Acknowledgment .....	xx

## **Section 1 Innovation in Teaching**

### **Chapter 1**

Inquiry-Based Learning: Encouraging Exploration and Curiosity in the Classroom.....	1
<i>Ahmad Qablan, United Arab Emirates University, UAE</i>	
<i>Ahmed Alkaabi, United Arab Emirates University, UAE</i>	
<i>Mohammed Humaid Aljanahi, United Arab Emirates University, UAE</i>	
<i>Suhair A. Almaamari, Emirates Schools Establishment, UAE</i>	

### **Chapter 2**

Active Learning From Early Childhood to Adolescence and Beyond: Teaching Curious Minds and Empowering Lifelong Learning .....	13
<i>Sara Al Suwaidi, Department of Education and Knowledge, UAE</i>	

### **Chapter 3**

Active Learning: Strategies for Engaging Students and Enhancing Learning.....	31
<i>Ahmad Qablan, United Arab Emirates University, UAE</i>	

### **Chapter 4**

Fostering Students' Critical Thinking Through the Implementation of Project-Based Learning .....	42
<i>Ashraf Moustafa, United Arab Emirates University, UAE</i>	
<i>Mohammad Al-Rashaida, United Arab Emirates University, UAE</i>	

### **Chapter 5**

Empowering All Students: Revolutionizing Education with Gamification, Project-Based Learning, and Inclusive Support .....	54
<i>Maria Efstratopoulou, United Arab Emirates University, UAE</i>	
<i>Zubaida Shraim, United Arab Emirates University, UAE</i>	
<i>Hadeel Saleh, United Arab Emirates University, UAE</i>	

## **Chapter 6**

Course Redesign for Authentic Learning and Active Citizenship: A General Education Course  
Context ..... 68

*Semiyu Aderibigbe, University of Sharjah, UAE*

### **Section 2**

#### **Innovation in Leadership**

## **Chapter 7**

Bridging Innovative Technologies With Progressive Educational Governance ..... 84

*Asma Khaleel Abdallah, Sharjah Education Academy, UAE*

*Badreyya Al Khanbooli, United Arab Emirates University, UAE*

*Noura Ali Mohammad Al Kaabi, Emirates Schools Establishment, UAE*

*Maymoona Abdulla Al Awadhi, Emirates Schools Establishment, UAE*

## **Chapter 8**

Developmental Supervisory Advancements: Refining the Art of Crafting Creative Approaches  
and Applications in Educational Leadership ..... 100

*Hesham R. I. Badawy, United Arab Emirates University, UAE*

*Ahmed Alkaabi, United Arab Emirates University, UAE*

*Wissal A. Mohsen, United Arab Emirates University, UAE*

*Khadija Alblooshi, United Arab Emirates University, UAE*

## **Chapter 9**

DREAM Educational Management and Leadership: A Student- and Teacher-Centred Approach to  
Inspire Change and Growth ..... 120

*Phil Quirke, Higher Colleges of Technology, UAE*

## **Chapter 10**

Modern Leaders, Revolutionary Results: Steering Transformation in Today's World ..... 134

*Rasha Khalil Abdallah, United Arab Emirates University, UAE*

*Osama A. S. Ismail, Van Hool-NV, Belgium*

### **Section 3**

#### **Chatbots in Education and Educational Technologies**

## **Chapter 11**

Diversity Management as a New Organizational Paradigm: Leading With Cultural Intelligence  
(CQ) ..... 149

*Meghry Nazarian, United Arab Emirates University, UAE*

*Ibrahim Duyar, Arkansas State University, USA*

*Mohamed Alhosani, United Arab Emirates University, UAE*

## **Chapter 12**

Chatbots in Classrooms: Tailoring Education and Boosting Engagement ..... 166

*Asma Khaleel Abdallah, Sharjah Education Academy, UAE*

*Ahmed M. Alkaabi, United Arab Emirates University, UAE*

*Duaa Abdel Fattah Mehiar, Middle East University, Jordan*

*Zainab Ali J. Aradat, Ministry of Education, UAE*

## **Chapter 13**

Transforming Education Through Technology and School Leadership ..... 182

*Hosam R. I. Badawy, United Arab Emirates University, UAE*

*Fatma Mohamed Al Ali, United Arab Emirates University, UAE*

*Asma Gul Yousaf Khan, United Arab Emirates University, UAE*

*Saad H. G. H. Dashti, United Arab Emirates University, UAE*

*Sumaia Abdulla Al Katheeri, United Arab Emirates University, UAE*

## **Chapter 14**

Promoting Responsible AI Practices: Legal Responsibilities of Teachers for Students With Special Needs in the United Arab Emirates..... 195

*Enas Mohammed Alqodsi, United Arab Emirates University, UAE*

*Iyad M. Jadalhaq, University of Sharjah, UAE*

*Mohammed El Hadi E. H. El Maknouzi, University of Sharjah, UAE*

*Imad Eldin Ahmad Abdulhay, University of Sharjah, UAE*

## **Chapter 15**

Navigating the Legal Landscape: AI Adoption in Education and Teacher Responsibilities ..... 212

*Enas Mohammed Alqodsi, United Arab Emirates University, UAE*

*Iyad Mohammad Jadalhaq, University of Sharjah, UAE*

*Mohammed El Hadi El Maknouzi, University of Sharjah, UAE*

*Imad Eldin Ahmad Abdulhay, University of Sharjah, UAE*

## **Section 4**

### **Innovation in Assessment and Evaluation**

## **Chapter 16**

The Power of Peer Review: Harnessing Collaborative Insights for Authentic Assessment ..... 232

*Asma Khaleel Abdallah, Sharjah Education Academy, UAE*

*Mona Humaid Aljanahi, Sharjah Education Academy, UAE*

*Hissah Abdulrahman Almejalli, Ministry of Education, Saudi Arabia*

## **Chapter 17**

Assessing the Unassessable: Breaking New Ground With Holistic Student Evaluations ..... 248

*Mohammed Borhandden Musah, Independent Researcher, Bahrain*

**Chapter 18**

The Role of Assessment in Driving Continuous School Improvement ..... 267

*Suleiman M. Hamdan, Sharjah Private Education Authority, UAE*

*Gihan Fradi, Ignite School, Dubai, UAE*

**Chapter 19**

3D Feedback: A Three-Dimensional Feedback Approach That Makes Students Feel, Think, and Act Big ..... 286

*Lutfieh Mohammad Rabbani, United Arab Emirates University, UAE*

*Mona Humaid Aljanahi, United Arab Emirates University, UAE*

**Chapter 20**

Alternative Assessment Methods: Moving Beyond Standardized Testing ..... 303

*Muna Jamel Awad, United Arab Emirates University, UAE*

*Mohammad Abdelkarim Al Adwan, Emirates National School, UAE*

**Compilation of References** ..... 321

**About the Contributors** ..... 380

**Index** ..... 389



# Detailed Table of Contents

Foreword .....	xvii
<b>Preface: Charting the Course – A Journey into Educational Innovation and Excellence .....</b>	<b>xviii</b>
Acknowledgment .....	xx

## Section 1 Innovation in Teaching

### Chapter 1

Inquiry-Based Learning: Encouraging Exploration and Curiosity in the Classroom.....	1
<i>Ahmad Qablan, United Arab Emirates University, UAE</i>	
<i>Ahmed Alkaabi, United Arab Emirates University, UAE</i>	
<i>Mohammed Humaid Aljanahi, United Arab Emirates University, UAE</i>	
<i>Suhair A. Almaamari, Emirates Schools Establishment, UAE</i>	

Inquiry-based learning is an approach to learning that encourages students to engage in problem-solving through exploration and high-level questioning. It incorporates active participation of students by involving them in posing questions and bringing real-life experiences to them. The basis of this approach is to channelize the students' thought process through queries and help them in "how to think" instead of "what to think." This chapter begins by defining constructivism as the theoretical origin of inquiry-based learning, it then moves to talk about the benefits and advantages of this approach on students' learning. It also discusses the multiple forms of inquiry-based learning that have been documented in the literature to increase student involvement in their learning. The chapter demonstrates the various types of inquiry-based learning that can be implemented to drive the teaching process.

### Chapter 2

Active Learning From Early Childhood to Adolescence and Beyond: Teaching Curious Minds and Empowering Lifelong Learning.....	13
<i>Sara Al Suwaidi, Department of Education and Knowledge, UAE</i>	

This chapter will focus on active learning and its application from the early years through adolescence. It will explore effective and impactful approaches and methods that promote critical thinking, engagement, and a love of learning in students of all ages. Active learning is not a brand-new idea; in fact, an early definition of the strategy describes it as "instructional activities involving students in doing things and thinking about what they are doing." Therefore, rather than just disseminating knowledge, active learning

tactics encourage students to partake in activities that call for higher-order thinking, such as reading, talking, and writing. They typically emphasize the value of having pupils reflect on their own attitudes and ideals as well.

### **Chapter 3**

Active Learning: Strategies for Engaging Students and Enhancing Learning..... 31  
*Ahmad Qablan, United Arab Emirates University, UAE*

This chapter introduces active learning and how students in various educational settings can best acquire, apply, create, and share knowledge. The chapter presents multiple forms of active learning that have been documented in the literature and deemed imperative to increase student engagement and deepen their understanding. The chapter also discusses the various perspectives concerning the implementation of active learning strategies in various educational contexts. A particular focus is given to the significance of metacognition as a critical skill that enables students to assess their own learning, and to critically assess sources of information. The chapter presents several suggested active learning strategies that are easy to implement in any classroom setting and are useful to connect classroom instruction, assessment, and management together.

### **Chapter 4**

Fostering Students' Critical Thinking Through the Implementation of Project-Based Learning ..... 42  
*Ashraf Moustafa, United Arab Emirates University, UAE*  
*Mohammad Al-Rashaida, United Arab Emirates University, UAE*

This chapter examines the role of project-based learning (PBL) in fostering students' critical thinking skills. By providing both theoretical foundations and practical insights, the chapter explores how PBL can create meaningful connections and enhance students' preparedness for the future. The authors emphasize key strategies employed in PBL, including active and differentiated learning, collaborative group work, critical thinking skills, and research and investigation. These strategies empower students to tackle real-world problems and challenges, enabling them to develop their critical thinking abilities. Throughout the chapter, the authors highlight the importance of PBL as an approach that promotes deeper learning and equips students with the skills needed to navigate the complexities of the world around them.

### **Chapter 5**

Empowering All Students: Revolutionizing Education with Gamification, Project-Based Learning, and Inclusive Support ..... 54  
*Maria Efstratopoulou, United Arab Emirates University, UAE*  
*Zubaida Shraim, United Arab Emirates University, UAE*  
*Hadeel Saleh, United Arab Emirates University, UAE*

This chapter focuses on innovative teaching strategies for students of determination in UAE. Gamification, project-based learning, and innovative use of technology in special education promise to revolutionize how we educate and support students with special needs in the schools today providing new opportunities for these students. Education nowadays is moving away from rote learning towards dynamic, interactive, and enjoyable educational experiences. Interactive educational approaches have gained considerable momentum not only in mainstream education but also as an important tool in special education. By infusing fun and engagement into learning, teachers have the

potential to unlock the talents of students with special educational needs or the gifted and talented. It is the collective responsibility of educators of the future to ensure an inclusive and supportive educational environment for all students, meeting their needs, and supporting them to reach their potential regardless of their abilities or challenges.

## **Chapter 6**

Course Redesign for Authentic Learning and Active Citizenship: A General Education Course

Context ..... 68

*Semiyu Aderibigbe, University of Sharjah, UAE*

As society evolves and students' needs rapidly change, educators are expected to keep exploring strategies to enhance the teaching and learning process. This chapter documents the approaches adopted to redesign a general education (GNED) course to foster students' authentic learning. Using a qualitative strategy, data collection and analyses were done to determine students' views of education and how they will support innovation, drawing on the redesigned course. The results indicate a variation in male and female understanding of education and its purposes, even though they all generally see it as a tool for societal transformation. The results also show that students consider involvement in innovation in the country essential and highlight measures they will take, including awareness campaigns, nurturing younger generations, and preserving cultural heritage. Based on the results, implications of the findings for stakeholders, such as instructors and institution leaders, are shared.

### **Section 2 Innovation in Leadership**

## **Chapter 7**

Bridging Innovative Technologies With Progressive Educational Governance ..... 84

*Asma Khaleel Abdallah, Sharjah Education Academy, UAE*

*Badreyya Al Khanbooli, United Arab Emirates University, UAE*

*Noura Ali Mohammad Al Kaabi, Emirates Schools Establishment, UAE*

*Maymoona Abdulla Al Awadhi, Emirates Schools Establishment, UAE*

Education today necessitates modernization through the latest digital tools and technologies. The integration of EdTech and leadership is crucial for advancing modern education. To effectively apply technology in educational institutions, understanding the role of leadership is essential. Education reforms are underway to stimulate innovation and enhance digital technology use, focusing on flexibility, student-centric approaches, and visionary leadership. Notable entities like UNESCO and Khan Academy are at the forefront of promoting comprehensive professional growth. Leadership styles, such as distributed, transformational, and visionary leadership, are pivotal in adapting to new technologies. The technology divide, marked by uneven access to devices and the internet, remains a significant challenge, often amplifying educational disparities. Adapting to new educational environments poses challenges for educators, necessitating that educational leaders prioritize stress reduction activities, collaboration, and a supportive work environment for teachers.

## Chapter 8

Developmental Supervisory Advancements: Refining the Art of Crafting Creative Approaches and Applications in Educational Leadership ..... 100

*Hesham R. I. Badawy, United Arab Emirates University, UAE*

*Ahmed Alkaabi, United Arab Emirates University, UAE*

*Wissal A. Mohsen, United Arab Emirates University, UAE*

*Khadija Alblooshi, United Arab Emirates University, UAE*

This chapter serves as an indispensable resource for educational leaders, offering a comprehensive exploration of developmental supervision's (DS) multifaceted impact in educational contexts. Rooted in a dynamic theoretical framework, it underscores developmental supervision's role in cultivating environments conducive to self-reflection, sustained learning, and pedagogical advancement. Drawing from psychology, education, and leadership studies, it exemplifies DS as a collaborative, data-driven practice significantly elevating teaching quality and student achievement. The chapter vividly illustrates the diverse applications of DS, spotlighting how observation, feedback, coaching, mentoring, and technology synergize to augment its efficacy. Robust empirical evidence reveals its substantial impact emphasizing advancements in teaching quality, student engagement, and academic achievement. By urging further empirical scrutiny and innovative strategies, the chapter positions DS as a cornerstone of educational leadership, underpinning the quest for comprehensive school improvement.

## Chapter 9

DREAM Educational Management and Leadership: A Student- and Teacher-Centred Approach to Inspire Change and Growth ..... 120

*Phil Quirke, Higher Colleges of Technology, UAE*

This chapter describes the DREAM educational management and leadership approach, which the author has been implementing, researching, and developing for two decades. The DREAM acronym is based on ten principles inspired by teachers that ensure the educational teacher leader focuses on students and their learning by placing teachers at the heart of the institution. DREAM stands for develop, recruit, enhance, appraise, motivate and delegate, respect, enjoy, attend, and mentor. These ten principles are sequenced to provide a pathway of continuous teacher leadership development although they are all interdependent and practiced as a coherent whole. Each of the sections within the chapter is based on a principle and describes how it has been applied in a variety of contexts using feedback from previous course participants. The aim is to provide the reader with a series of short case studies of the DREAM approach in action.

## Chapter 10

Modern Leaders, Revolutionary Results: Steering Transformation in Today's World..... 134

*Rasha Khalil Abdallah, United Arab Emirates University, UAE*

*Osama A. S. Ismail, Van Hool-NV, Belgium*

In every field, innovation remains pivotal, especially in the realm of education where it consistently refines the teaching and learning experience. This chapter delves into the profound influence and significance of innovation in reshaping educational facets. Emphasis is placed on the transformative leadership in education and its alignment with progressive and inventive cultures. The discourse highlights the capability of transformational leadership to foster professional growth and a spirit

of teamwork. Evidence suggests that both educators and students thrive under transformational leadership, benefiting from its capacity to motivate, and instigate positive change. The chapter underscores the value of continuous learning and professional enhancement for transformational leaders, as it cultivates an enduring learning ethos, crucial for professional evolution. Furthermore, this chapter presents tactics that transformational leaders might employ to stimulate progress in the educational sector.

### **Section 3**

#### **Chatbots in Education and Educational Technologies**

#### **Chapter 11**

Diversity Management as a New Organizational Paradigm: Leading With Cultural Intelligence

(CQ) ..... 149

*Meghry Nazarian, United Arab Emirates University, UAE*

*Ibrahim Duyar, Arkansas State University, USA*

*Mohamed Alhosani, United Arab Emirates University, UAE*

In an era of globalization and increased diversity, there is a wide agreement on the need to actively deal with diversity in educational organizations. In this scenario, the challenge of global competition for UAE schools requires principals to lead differently and deal more effectively with teachers from diverse cultural backgrounds and fulfil their diverse needs. There is strong empirical evidence for the positive link between effective diversity management and overall organizational effectiveness. This chapter sheds light on cultural intelligence (CQ) as a viable entrée from which leaders can manage diversity effectively and lead in multicultural settings successfully. This chapter also unlocks several key multidisciplinary trends between diversity management and organizational performance outcomes.

#### **Chapter 12**

Chatbots in Classrooms: Tailoring Education and Boosting Engagement ..... 166

*Asma Khaleel Abdallah, Sharjah Education Academy, UAE*

*Ahmed M. Alkaabi, United Arab Emirates University, UAE*

*Duaa Abdel Fattah Mehiar, Middle East University, Jordan*

*Zainab Ali J. Aradat, Ministry of Education, UAE*

In the digital age, businesses must enhance customer experiences, with artificial intelligence (AI) chatbots proving pivotal in this endeavor. These chatbots, powered by AI, deliver personalized customer interactions, reshaping customer engagement. Operating through websites and mobile apps, they address user queries in real-time conversations. This chapter examines the potential of chatbots in education, elucidating benefits for students and educators. Categorization and functions of educational chatbots are explored, alongside insights into their design and development, leveraging machine learning and language processing. The advantages of chatbots for students are underscored. Ethical considerations are essential when deploying chatbots, ensuring security. Overcoming barriers in education, the chapter proposes strategies to optimize chatbot use, fostering effective implementation.

### **Chapter 13**

Transforming Education Through Technology and School Leadership ..... 182

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*Fatma Mohamed Al Ali, United Arab Emirates University, UAE*

*Asma Gul Yousaf Khan, United Arab Emirates University, UAE*

*Saad H. G. H. Dashti, United Arab Emirates University, UAE*

*Sumaia Abdulla Al Katheeri, United Arab Emirates University, UAE*

In an era where technological advancements are shaping facet of our lives, education stands as promising domains for positive change. The fusion of technology and school leadership is revolutionizing the way students learn, teachers teach, and administrators manage educational institutions. This chapter explores the pivotal role that technology plays in school leadership, highlighting its potential to create a more effective, equitable, and engaging learning environment, there is no reason to assume a new gadget will result in new teaching practices if our technology integration tactics do not change. Students are producing remarkable work in some iPad courses. Tablets are generally used to duplicate current procedures, nevertheless. School leaders must work with their communities to develop a vision how new technology will improve instruction, support educators in imagining how new technologies can support those visions, and support teachers and students as they transition from using tablets for consumption to using them for curation, creation, and connection.

### **Chapter 14**

Promoting Responsible AI Practices: Legal Responsibilities of Teachers for Students With Special Needs in the United Arab Emirates..... 195

*Enas Mohammed Alqodsi, United Arab Emirates University, UAE*

*Iyad M. Jadalhaq, University of Sharjah, UAE*

*Mohammed El Hadi E. H. El Maknouzi, University of Sharjah, UAE*

*Imad Eldin Ahmad Abdulhay, University of Sharjah, UAE*

This research delves into responsible AI practices in UAE education, specifically focusing on the legal responsibilities of educators working with students who have special needs. With AI technologies evolving and reshaping education, it's crucial to examine the legal framework and educators' duties. The primary objective is to comprehensively analyze the legal landscape in the UAE, encompassing education regulations and policies. Through this thorough exploration, the research aims to provide valuable insights and practical recommendations for promoting responsible AI practices in special education. Ultimately, the findings are intended to guide educators in navigating their legal responsibilities and ethical considerations while seamlessly integrating AI technologies for the benefit of special needs students in the United Arab Emirates.

### **Chapter 15**

Navigating the Legal Landscape: AI Adoption in Education and Teacher Responsibilities ..... 212

*Enas Mohammed Alqodsi, United Arab Emirates University, UAE*

*Iyad Mohammad Jadalhaq, University of Sharjah, UAE*

*Mohammed El Hadi El Maknouzi, University of Sharjah, UAE*

*Imad Eldin Ahmad Abdulhay, University of Sharjah, UAE*

This research delves into the legal implications surrounding the adoption of artificial intelligence (AI) in the field of education and explores the corresponding responsibilities of teachers. As AI continues to shape the educational landscape, it becomes crucial to understand and navigate the legal framework

governing its implementation. The study examines the legal challenges and considerations that arise when integrating AI technologies in educational settings and specifically focuses on the responsibilities that teachers bear in this context. By examining relevant laws, regulations, and policies, the research aims to provide valuable insights into the legal landscape of AI adoption in education and assist teachers in fulfilling their obligations while leveraging AI technologies responsibly.

## **Section 4 Innovation in Assessment and Evaluation**

### **Chapter 16**

The Power of Peer Review: Harnessing Collaborative Insights for Authentic Assessment ..... 232

*Asma Khaleel Abdallah, Sharjah Education Academy, UAE*

*Mona Humaid Aljanahi, Sharjah Education Academy, UAE*

*Hissah Abdulrahman Almejalli, Ministry of Education, Saudi Arabia*

This chapter delves into the transformative power of peer review in educational settings, exploring its application in fostering critical thinking, collaboration, and metacognitive skills among students. It examines various peer review methodologies, emphasizing their role in enhancing student engagement, motivation, and soft skills development. The chapter highlights the significance of integrating peer review into teaching strategies, outlining its benefits in building a cooperative learning environment. Through case studies and practical applications, the chapter demonstrates the efficacy of peer review in improving academic outcomes and fostering a culture of continuous improvement and innovation in educational practices.

### **Chapter 17**

Assessing the Unassessable: Breaking New Ground With Holistic Student Evaluations ..... 248

*Mohammed Borhandden Musah, Independent Researcher, Bahrain*

This chapter offers an in-depth analysis of holistic assessment frameworks in educational systems, accentuating the critical role of non-academic skills—including emotional intelligence, cognitive flexibility, and interpersonal communication—in student development. It acknowledges the inherent difficulties in quantifying such complex competencies and introduces cutting-edge, technology-driven evaluation techniques designed to seamlessly integrate into current educational practices. By examining real-world case studies, the narrative showcases how these progressive methodologies are being applied in diverse educational contexts. It underscores the imperative for educators to broaden their evaluative scope, ensuring that students not only excel academically but also develop the essential soft skills needed to navigate and succeed in the multifaceted challenges of the future. The chapter serves as a pivotal reference for stakeholders in education reform, advocating for a balanced approach to student assessment that aligns with the evolving demands of the 21st century.

### **Chapter 18**

The Role of Assessment in Driving Continuous School Improvement ..... 267

*Suleiman M. Hamdan, Sharjah Private Education Authority, UAE*

*Gihan Fradi, Ignite School, Dubai, UAE*

Assessment plays a pivotal role in the school improvement in ensuring its effectiveness, continuity, and impact. Equally important is the utilization of reliable data that enables schools to identify, address and achieve desired

improvements. The chapter explores the role of assessments and the use of data in the continuous school improvement process, and examines assessment practices, professional collaboration and assessment literacy that contribute to positive changes in schools. The chapter also highlights the impact of effective assessment practices in improving schools through a study of four private schools in the Emirate of Sharjah, United Arab Emirates that made significant improvement in their level of educational quality by adopting effective assessment processes.

**Chapter 19**

3D Feedback: A Three-Dimensional Feedback Approach That Makes Students Feel, Think, and Act Big ..... 286  
*Lutfieh Mohammad Rabbani, United Arab Emirates University, UAE*  
*Mona Humaid Aljanahi, United Arab Emirates University, UAE*

Feedback is a vital component of formative assessment processes. Criteria for providing effective feedback practices have been reinforced in governments’ recent educational documents. The development of engaging feedback approaches that foster students’ progress and maximize their motivation has gained increased popularity in both research and practice. This chapter aims to present a three-dimensional approach to providing feedback (3D feedback) that supports student engagement with feedback comprehensively—emotionally, cognitively, and behaviorally. Within this frame, an inclusive account of key indicators/activities reflecting the three dimensions of engagement with feedback is provided, along with their pedagogical implications. This is potentially useful to educators who are interested in adopting feedback interactions that are meaningful and stimulating to students, with clear purposes. The chapter also proposes guidelines for high-quality, engaging, and formative feedback, drawing on best practice principles and research findings.

**Chapter 20**

Alternative Assessment Methods: Moving Beyond Standardized Testing ..... 303  
*Muna Jamel Awad, United Arab Emirates University, UAE*  
*Mohammad Abdelkarim Al Adwan, Emirates National School, UAE*

The chapter delves into the realm of educational assessment, emphasizing the pivotal role it plays in understanding learners’ skills and competencies. It scrutinizes the flaws of the standardized testing methods as primary assessment tools. It advocates for a shift towards alternative assessment methods. The chapter addresses concerns surrounding subjectivity, reliability, fairness, and validity in alternative assessments, providing strategies to ensure their effectiveness. The chapter also outlines practical steps to support teachers in implementing alternative assessments. Balancing alternative assessments with standardized tests is also explored, highlighting the importance of thoughtful curriculum mapping. Finally, the chapter discusses overcoming barriers to implementation, emphasizing the need for comprehensive training and seamless integration into curriculum and instruction. By adopting alternative assessment methods, educational institutions can enhance the quality of evaluation and promote a more inclusive and comprehensive approach to assessing student achievement.

**Compilation of References** ..... 321  
**About the Contributors** ..... 380  
**Index** ..... 389



## Foreword

*Education on the Cutting Edge: Innovation in Teaching, Leadership, Technology and Assessment* is one of the vital resources and cornerstones in the educational literature nowadays where technological advances and innovative practices continually reshape the landscape of education. It reflects the UAE's commitment to fostering an innovative education system as well as it resonates with the UAE national agenda of equipping the next generation with skills for the future, emphasizing the importance of dynamic leadership, and embracing technological advancements in education.

The book aligns with the Hamdan Foundation's vision of educational excellence and nurturing innovative talent. Reflecting the UAE's educational system, it resonates with the Foundation's mission to support creative individuals and implement leading educational programs internationally. The book introduces advanced pedagogies and technologies, contributing to distinguished educational performance and supporting talent development, thereby enhancing the Foundation's global standing and commitment to institutional excellence and client satisfaction.

It transcends academic discussions, serving as a roadmap for innovative teaching and leadership, and is essential for educators, leaders, administrators, and policymakers. The chapters reflect the UAE's progressive education sector, guiding the future of education with a focus on outcomes-based, effective, and relevant learning. *Education on the Cutting Edge* is a catalyst for change, inspiring educators and leaders to challenge the status quo, think creatively, and lead with vision and purpose.

I would also like to extend my gratitude to the book's editors for their invaluable assistance. Their dedication and expertise have significantly enhanced educational standards, impacting not only the United Arab Emirates but also the global educational landscape.

*Khalifa Al Suwaidi*

*Hamdan bin Rashid Al Maktoum Foundation for Medical and Educational Sciences, UAE*

## Preface: Charting the Course – A Journey into Educational Innovation and Excellence

The book "Education on the Cutting Edge: Innovation in Teaching, Leadership, Technology & Assessment" offers a comprehensive exploration of modern educational strategies and practices. It starts with the transformative potential of peer review in enhancing critical thinking and collaboration among students. The book then delves into holistic student evaluations, underscoring the importance of non-academic skills in education. It explores the integration of innovative technologies and leadership in modernizing education, emphasizing the need for flexible, student-centric approaches. The chapters discuss a range of topics including inquiry-based learning, the role of active learning from early childhood, the significance of developmental supervision in educational leadership, and the use of technology like AI and chatbots in classrooms. The book also covers the importance of diversity management and cultural intelligence in education, highlighting the need for inclusive teaching strategies and responsible AI practices. Overall, it serves as a valuable resource for educators, leaders, and policymakers, providing insights into the evolution and enhancement of educational practices.

The topics covered in "Education on the Cutting Edge: Innovation in Teaching, Leadership, Technology & Assessment" are highly relevant in today's education landscape. The book addresses key contemporary challenges and opportunities in education, such as the need for effective peer review practices, holistic student evaluations, and the integration of advanced technology. It emphasizes the importance of developing critical thinking, emotional intelligence, and leadership skills in an increasingly digital and diverse world. The book's exploration of innovative teaching methods, the role of AI in education, and the need for flexible, student-centered approaches align with current educational reforms and the evolving demands of 21st-century learning environments.

The target audience for "Education on the Cutting Edge: Innovation in Teaching, Leadership, Technology & Assessment" is multifaceted. It includes educators, who will find valuable insights into peer review, inquiry-based learning, and active learning strategies; educational leaders and administrators, who will benefit from chapters on educational governance, technology integration, and leadership; policymakers and reform advocates, who can draw on the research and case studies presented to inform policy decisions; and students in education and leadership programs, who can use the book as a resource for understanding contemporary educational practices and their impact. This diverse audience reflects the comprehensive nature of the book, which addresses various facets of modern education.

The chapters in "Education on the Cutting Edge: Innovation in Teaching, Leadership, Technology & Assessment" cover a range of innovative educational strategies and approaches. "The Power of Peer Review" and "Assessing the Unassessable" focus on enhancing student engagement and holistic evaluations. "Bridging Innovative Technologies" and "Alternative Assessment Methods" discuss the integration of technology and inquiry-based learning in education. Chapters like "Inquiry-Based Learning" and "Active

***Preface: Charting the Course – A Journey into Educational Innovation and Excellence***

Learning from Early Childhood to Adolescence and Beyond” highlight active and exploratory learning methods. “Developmental Supervisory Advancements” and “Transforming Education Landscape Using Portfolio Assessment” explore the roles of educational leadership and technology in teaching. The book also delves into critical thinking through project-based learning, diversity management, inclusive teaching strategies, and the use of AI and chatbots in classrooms, underlining the importance of data in school improvement, legal aspects of AI, and the role of leadership in fostering educational innovation.

The book “Education on the Cutting Edge: Innovation in Teaching, Leadership, Technology & Assessment” significantly impacts the field of education by offering innovative approaches to teaching, leadership, educational technology, and assessment. It provides practical insights and theoretical frameworks for enhancing teaching methodologies, adopting new leadership models, integrating AI and chatbots in classrooms, and advancing assessment strategies. This comprehensive collection serves as a vital resource for educators, leaders, and policymakers aiming to navigate and shape the evolving educational landscape, emphasizing a balanced approach to student development and institutional growth.

“Education on the Cutting Edge” significantly impacts education by providing innovative approaches to teaching, leadership, educational technology, and assessment. It stands as a crucial guide for those seeking to understand and shape the future of education, emphasizing a balanced approach to student development and institutional growth.

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## Editorial Advisory Board

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Our heartfelt appreciation extends to the global community of academic contributors from across the UAE, Jordan, Saudi Arabia, Bahrain, the USA, Canada, and Ghana. Each contributor's unique perspective and depth of knowledge have immeasurably enriched this volume, weaving a rich tapestry of educational insights.

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We recognize that this book is the result of many hands and minds working together towards a common goal. We are deeply thankful to everyone who played a part in bringing this project to fruition, contributing to what we believe is a valuable resource in the field of education.


Section 1

# Innovation in Teaching

# Chapter 1

## Inquiry–Based Learning: Encouraging Exploration and Curiosity in the Classroom

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### ABSTRACT

*Inquiry-based learning is an approach to learning that encourages students to engage in problem-solving through exploration and high-level questioning. It incorporates active participation of students by involving them in posing questions and bringing real-life experiences to them. The basis of this approach is to channelize the students' thought process through queries and help them in "how to think" instead of "what to think." This chapter begins by defining constructivism as the theoretical origin of inquiry-based learning, it then moves to talk about the benefits and advantages of this approach on students' learning. It also discusses the multiple forms of inquiry-based learning that have been documented in the literature to increase student involvement in their learning. The chapter demonstrates the various types of inquiry-based learning that can be implemented to drive the teaching process.*

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## **INTRODUCTION**

The constructivist view of learning profoundly influences our understanding of teaching and learning. Tobin (1993) highlighted constructivism as a paradigm shift in educational thought, describing learning as a dynamic, social process where learners actively constructed meaning based on their prior knowledge. Social constructivism, further elaborated by Driver et al. (1994), emphasizes the essential role of social settings in learning, which suggests that knowledge is constructed through interactions in educational environments (Ullrich, 1999). Constructivists advocate for teaching methods that enable students to connect their prior knowledge with new information, while considering their diverse backgrounds and experiences in the process (Bullough, 1994; Ullrich, 1999). The adoption of constructivism and inquiry-oriented teaching is widely supported by educators (Abd-El-Khalick et al., 2004; National Research Council, 2000; Slavin, 1994; Stofflett & Stoddart, 1994). They argue that these methods stimulate students' conceptual understanding by encouraging them to build on their existing knowledge and actively engage with new information, applying their learning in real-life contexts.

Despite varying interpretations of inquiry in education, many educators agree on its core elements. As Howes et al. (2008) suggested, inquiry in the classroom involves “doing what scientists do.” This view aligns with the National Science Education Standards (National Research Council, 1996), which defined inquiry as:

*A multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze and interpret data; proposing answers, explanations, and predictions; and communicating the results. (p. 1)*

The literature documents several benefits of inquiry-based teaching and learning. Lord and Orkwiszewski (2006) argued that it effectively improved students' content knowledge, scientific process skills (Deters, 2005; Hofstein et. al., 2004), attitudes toward learning, motivation (Tuan et al., 2005), and communication skills (Deters, 2005).

## **ESSENTIAL FEATURES OF INQUIRY TEACHING**

The inquiry process adopts a scientific methodology, beginning with the formulation of questions about scientific phenomena and seeking answers to these queries. This approach enables learners to develop various skills, including scientific skills like critical thinking and problem-solving, as well as communication skills encompassing collaboration and idea sharing. The literature highlights five key features of science inquiry that aid students in understanding the methods scientists use to acquire knowledge (National Research Council, 2000).

### **Learners are Engaged by Scientifically Oriented Questions**

Scientific questions often stem from observations of objects, organisms, and events in nature. These questions are central to inquiry, leading to empirical investigations and the use of data to explain in-

## ***Inquiry-Based Learning***

investigated phenomena. Scientists typically recognize two primary types of inquiry questions: existence questions, which include many “why” queries (e.g., Why do objects fall towards Earth? Why do humans have chambered hearts?), and causal or functional questions that explore mechanisms, often phrased as “how” questions (e.g., How does sunlight aid plant growth?).

In educational settings, many “why” questions can be reframed as “how” questions to facilitate investigation and simplify answers. This refinement sharpens the focus of inquiry and makes it more scientific. Classroom questions should be robust and engaging, and spark curiosity and the desire to explore. These questions can arise from various sources, including learners, teachers, instructional materials, or digital platforms. The teacher’s role in refining and focusing students’ questions is crucial. Effective inquiries emerge from questions that are meaningful, engaging, relevant, and investigable at the students’ developmental and ability levels. Skilled teachers guide students in refining their questions, which leads to both interesting and productive investigations.

## **Learners Prioritize Evidence to Develop and Evaluate Explanations**

Learners focus on evidence to construct and assess explanations for scientifically oriented questions. Credible scientific investigations hinge on empirical evidence as the foundation for developing valid explanations about specific phenomena. Scientists prioritize obtaining accurate data from observations, whether in natural settings like oceans or controlled environments like laboratories. They rely on their senses and instruments that measure otherwise undetectable characteristics, such as magnetic fields. Sometimes, scientists control conditions to gather evidence; other times, they observe under a variety of natural conditions over extended periods to infer the influence of different factors (Darawsheh et al,2023). The validity of evidence is ensured through repeated measurements and observations or by collecting different data types related to the same phenomenon. This evidence is then subject to further inquiry and scrutiny.

In classroom inquiries, students similarly use evidence to formulate explanations for the phenomena they study. They might observe natural elements like plants, animals, and rocks, or social, economic, and political phenomena, noting their characteristics and attributes. They measure temperature, distance, and time, observe chemical reactions, Moon phases, and chart progress, or gather evidence from various sources, including teachers, instructional materials, and the internet, to fuel their inquiries.

## **Learners Formulate Explanations from Evidence**

Inquiry-based learning emphasizes the reliance on evidence to construct scientific explanations. These explanations, grounded in reason, seek to provide causes for effects and establish relationships based on evidence and logical argumentation. Consistency with experimental and observational evidence about phenomena is paramount. Explanations must respect rules of evidence, be open to criticism, and involve cognitive processes such as classification, analysis, inference, prediction, critical reasoning, and logic. Explanations aim to make the unfamiliar understandable by relating observations to existing knowledge. Thus, they extend beyond current understanding to propose new insights. In science, this involves building upon the existing knowledge base to comprehend unclear phenomena. For students, it means constructing new ideas based on their prior understanding, which results in new knowledge.



## **Learners Evaluate Their Explanations Against Alternatives**

A key feature of scientific inquiry is the evaluation, and sometimes revision or rejection, of explanations in light of alternative views, especially those grounded in scientific understanding. Critical questions include questions like: Does the evidence support the proposed explanation? Is the question adequately addressed by the explanation? Are there biases or flaws in the reasoning linking evidence and explanation? Can other plausible explanations be derived from the evidence? As students engage in dialogue, compare results, and review their findings against teacher or instructional material suggestions, alternative explanations may emerge. An important aspect of this process is ensuring students connect their findings with accepted scientific knowledge at a level appropriate to their developmental stage. Student explanations should align with current scientific understanding.

## **Learners Communicate and Justify Their Proposed Explanations**

In scientific communication, explanations are presented in a manner that allows for replication by others. This involves clearly articulating the question, methods, evidence, proposed explanation, and considering potential alternatives, which fosters critical review and further application or questioning by other scientists. Encouraging students to share their explanations allows others to pose new questions, scrutinize evidence, identify flawed reasoning, challenge unsupported assertions, and propose alternative interpretations. This exchange can either question or reinforce the links students have made between the evidence, existing scientific knowledge, and their explanations. Through this process, students can address inconsistencies and strengthen their arguments based on empirical evidence.

## **LEVELS OF INQUIRY LEARNING**

### **Structured Inquiry**

At this foundational level, students are given specific questions to investigate, following set procedures to collect and analyze data, which leads them to an answer for the initial inquiry question. Structured inquiry is commonly employed in elementary classrooms, where students benefit from additional support and direction in their investigations.

### **Guided Inquiry**

In guided inquiry, the teacher plays an active role in steering students through their inquiry process. This involves assisting students in formulating investigable questions and contemplating appropriate experimental designs to address these questions. This approach offers students more autonomy in question formulation compared to structured inquiry and is typically used in middle school settings.

### **Open-Ended Inquiry**

This advanced level of inquiry adopts a more flexible approach. Students are presented with a problem or phenomenon to investigate, encouraged to generate their own questions, and design experiments to collect and

## ***Inquiry-Based Learning***

analyze data in response to these questions. Open-ended inquiry is often utilized in higher grade levels, where students are more independent and encouraged to explore their interests through self-guided investigations.

## **BENEFITS OF INQUIRY-BASED LEARNING**

### **Encourages Engaged Learning**

Inquiry-based learning actively engages students, stimulating their interest and thinking. This heightened engagement often leads to enhanced knowledge acquisition, skill development, and attitudinal growth.

### **Fosters Critical Thinking**

This learning approach cultivates critical thinking skills as students engage in investigations. They are encouraged to present and critique their findings among peers, thereby honing their problem-solving and critical-thinking abilities.

### **Sparks Creativity**

Inquiry-based learning nurtures students' creativity. Given the freedom to explore their interests independently, students frequently devise innovative solutions, especially in open-ended inquiry scenarios.

### **Enhances Problem-Solving Skills**

The process of inquiry learning sharpens problem-solving skills. Confronting real-world problems, students learn to think innovatively and devise creative solutions, which are invaluable skills for future investigative endeavors.

### **Facilitates Understanding of Complex Topics**

Inquiry learning aids in grasping complex subjects. Through unrestricted investigation of phenomena of interest, students achieve deeper and more meaningful comprehension.

### **Improves Communication Skills**

Engagement in inquiry learning enhances communication abilities. As students work on problems or investigations, they often find themselves explaining their ideas, results, and analyses to others, which refines their capacity to articulate their thoughts effectively.

### **Links Learning to Real-Life Contexts**

Inquiry learning connects learners to real-world situations. As students explore issues relevant to their environment, they perceive the applicability of classroom learning to real-world scenarios. This fosters a more profound understanding of the concepts they explore.

## CLASSROOM INQUIRY MODELS

### STEM Teaching Model

STEM is an interdisciplinary educational approach that emphasizes hands-on, experiential learning to prepare students for careers in science, technology, engineering, and mathematics (Ibrahim et al., 2023; Qablan et al., 2023). This methodology, highlighted by Bataineh et al. (2022), aims to cultivate inquisitive minds, logical reasoning, and collaborative skills. It often includes participation in university research programs that allow students to actively contribute to the development of new technologies and pioneering research (Khalil et al., 2023). To maintain student engagement and enhance their understanding of STEM subjects, educators are encouraged to employ a variety of teaching methods, each contributing uniquely to the learning experience.

### Engineering Design Process

The Engineering Design Process (EDP) is a structured approach for planning STEM lessons, involving a series of steps for problem-solving in project-based learning. This method promotes open-ended designs, creativity, and practical solutions (Nguyen et al., 2021). The following are steps in the EDP problem-solving approach:

**Ask.** Students are presented with a problem or project and asked to develop a product/design solution. They start by asking critical questions about their task or desired creation.

**Research.** Students gather information about their project, utilizing resources like the internet, teacher or expert consultations, STEM volunteers, laptops for research, or relevant videos.

**Imagine.** In teams, students brainstorm potential solutions. This collaborative stage ensures every student contributes, with the teacher fostering a judgment-free environment for idea generation.

**Plan.** Teams select a solution and strategize its implementation, considering their initial questions, research findings, and brainstormed ideas.

**Create.** Students build a prototype based on their plans. This phase allows for creativity and practical application, which tests the functionality and adherence to original requirements.

**Test.** Students devise methods to evaluate their solutions' effectiveness, assessing whether they address the problem. Teachers can facilitate peer review discussions to promote deep thinking and collaboration.

**Improve.** The final step involves feedback and discussions on enhancements. Students then redesign and refine their products and repeat this cycle until satisfied with the outcome.

### The Inquiry Cycle Model

The 5E model, developed by the Biological Sciences Curriculum Study (BSCS) (Bybee et al., 2006), represents a constructivist approach to inquiry teaching and learning. It enhances students' understanding through hands-on experiences and is designed in a cyclical format. This model has gained widespread adoption and adaptation among educators. The 5E instructional model is comprised of five phases: engage, explore, explain, elaborate, and evaluate. Throughout these stages, students collaboratively observe, investigate, analyze, and draw conclusions. With the teacher serving more as a facilitator than a lecturer, this model is particularly effective for integrated subjects like STEM. It encourages students to deeply engage with and critically examine new concepts and ensures meaningful learning experiences. Stud-

## ***Inquiry-Based Learning***

ies have shown that the 5E model is more effective in helping students acquire scientific concepts than traditional textbook-focused methods. The following sections detail the specific activities and objectives of each phase in the 5E learning model.

### **Engagement**

This initial phase draws students into the learning task by focusing their attention on a phenomenon, object, problem, situation, or event. Activities connect to prior experiences and reveal misconceptions, which create cognitive disequilibrium. Engagement methods include posing questions, defining problems, presenting discrepant events, or simulating problematic situations. The teacher's role is to introduce the situation, define the instructional task, and establish rules and procedures. Successful engagement stimulates and motivates students, and involves both mental and physical activity.

### **Exploration**

Following engagement, students feel a need to explore ideas and test hypotheses. Exploration activities provide common, concrete experiences for concept, process, and skill formulation. The cognitive disequilibrium from the engagement phase is leveraged here to help students regain cognitive equilibrium. Exploration aims to create experiences for later formal introduction and discussion of concepts, processes, or skills. Students actively engage in exploring objects, events, or situations, thereby establishing relationships, observing patterns, identifying variables, and questioning events. The teacher facilitates and coaches these efforts and initiates activities that allow students to investigate based on their interpretations of the phenomena.

### **Explanation**

The explanation phase centers around students constructing answers to their inquiry questions using data analysis. Students and teachers utilize terminology relevant to the concepts or phenomena being studied. Here, the teacher first guides students to present their explanations and then introduces scientific or technological explanations in a clear, direct, and formal way. This phase orders the exploration experiences logically to respond to research questions. Teachers should build on students' explanations and link them to experiences from the engagement and exploration phases (Jandigulov et al,2023). The objective is to present concepts, processes, or skills in a brief, straightforward, and clear manner before progressing to the next phase. Various strategies are employed by teachers in this phase. They might use verbal explanations, videos, films, or educational software to aid students in constructing their explanations. This stage is crucial for organizing thoughts and providing terminology for explanations. Ultimately, students should articulate their exploratory experiences using common terms.

### **Elaboration**

In the elaboration phase, students apply their newly developed explanations and terminology to extended learning experiences. This phase encourages the application of concepts, processes, or skills to new, closely related situations. Sometimes, students may retain misconceptions or understand concepts only in the context of their exploratory experiences. Elaboration activities offer additional experiences to

reinforce learning. Students engage in group discussions and information-seeking activities during this phase. They present and defend their approaches, refine the task's definition, and identify necessary information for successful completion. Information sources include peers, teachers, printed materials, experts, electronic databases, and their experiments to form an information base. These group discussions enable students to elaborate on their task conception, information sources, and potential strategies. Group interactions are vital in this phase as they provide opportunities for students to express their understanding and receive feedback from peers at similar comprehension levels. Elaboration also involves introducing students to new situations and problems that require applying similar explanations, aiming to generalize concepts, processes, and skills.

## Evaluation

The evaluation phase is where students assess their understanding using their acquired skills. They should also receive feedback on the adequacy of their explanations. Informal evaluation may occur throughout the 5E cycle, with a more formal evaluation following the elaboration phase. As part of practical educational practice, teachers assess learning outcomes during this phase, using various assessments to gauge each student's understanding level.

## **Gather, Reason, Communicate (GRC) Framework**

The Gather, Reason, Communicate (GRC) framework is a student-centric instructional approach designed to help students comprehend phenomena across natural, social, economic, historical, and other domains through scientific and engineering practices. This framework can be integrated into the 5E instructional model's lesson planning.

### Gathering Stage

At this stage, instruction is centered around phenomena, engaging students in various science and engineering practices such as questioning, investigation, qualitative observation, and quantitative data recording. Students explore observable phenomena or events to collect evidence supporting scientific explanations. Anchoring learning in observable phenomena aids students in making sense of real-world observations. Essential observation skills, including inferring, measuring, communicating, predicting, and classifying, are employed by scientists in their research. Students apply these skills to begin addressing their questions about the observed phenomena.

### Reasoning Stage

The reasoning stage in the GRC framework involves critical thinking practices. Here, students engage in activities such as analyzing data, constructing evidence-based explanations, evaluating data collection techniques, employing computational thinking, and developing explanations grounded in collected evidence. They utilize key ideas and concepts from the previous stage to interpret data and construct reasoned arguments, using models to explain natural phenomena and support their explanations with evidence.

## ***Inquiry-Based Learning***

### **Communicating Stage**

In this stage, students articulate their explanations and arguments, both written and oral, to demonstrate how their evidence substantiates their conclusions. They participate in a critical exchange of ideas, offering and receiving feedback on their explanations, and citing relevant evidence and reasoning. Additionally, students employ models to convey their thought processes and make their reasoning visible, which enhances communication and understanding of their scientific arguments.

### **LIMITATIONS AND CAVEATS**

While the merits of inquiry-based learning are significant, it is equally important to recognize its limitations and challenges. These include practical difficulties in implementation, a deficit in specialized curricula and adequate teacher training, and the considerable psychological burden on educators (Khalaf & Zin, 2018). Moreover, unique cultural aspects of inquiry-based learning and varying stakeholder expectations (Dai et al., 2012) add to its complexity. The time-intensive nature of this approach may not always align with established academic assessment cycles, which poses additional logistical challenges for schools (Khalaf & Zin, 2018). Successful implementation is contingent upon comprehensive teacher training and adequate school investment (Alkaabi, 2023; Alkaabi et al., 2023; Alkaabi & Almaamari, 2020; Almaktoom & Alkaabi, 2024). This training might include mentorship programs where experienced teachers guide novices and formal training sessions, which are essential for teacher upskilling despite their costs. Inquiry-based learning will have a profound impact when it becomes a normative practice in the school, greatly influencing overall school performance. This norm can be established with the support of the administrative team and the school community staff (Al-Zoubi et al., 2023). Finally, the considerable psychological demands placed on teachers, who play a pivotal role in facilitating student inquiry and deep engagement, can lead to increased stress and a higher risk of burnout.

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## Chapter 2

# Active Learning From Early Childhood to Adolescence and Beyond: Teaching Curious Minds and Empowering Lifelong Learning

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### **ABSTRACT**

*This chapter will focus on active learning and its application from the early years through adolescence. It will explore effective and impactful approaches and methods that promote critical thinking, engagement, and a love of learning in students of all ages. Active learning is not a brand-new idea; in fact, an early definition of the strategy describes it as “instructional activities involving students in doing things and thinking about what they are doing.” Therefore, rather than just disseminating knowledge, active learning tactics encourage students to partake in activities that call for higher-order thinking, such as reading, talking, and writing. They typically emphasize the value of having pupils reflect on their own attitudes and ideals as well.*

### **INTRODUCTION**

The earlier definition of active learning is so broad that Bonwell and Eison (1991) freely admit that it may cover a wide range of activities. They recommend a range of techniques to encourage active learning, from the very straightforward (such as interrupting lectures to let students debate their ideas with neighbors in order to clarify and organize them) to the more intricate (such as using case studies as a focal point for decision-making). Active learning can only be validated as successful when placed alongside assessment, and the distinction between active learning and formative assessment is hazy and difficult to define, according to Handelsman, et al., (2007). After all, teaching that encourages students’

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active learning requires them to do or produce something, which can then help assess understanding (Handelsman et al., 2007).

Any strategy to engage students and enhance learning can be highly dependent on the age of the students and the subject matter involved (Khalil et al., 2023; Qablan et al., 2023; Qablan & Al-Qaderi, 2009), but no matter what their age, all students learn best when they are comfortable in the learning environment (Deignan, 2018). The place of learning through play in the early years is often replaced, as play is seen as increasingly less relevant after the age of eight (Ward, 2016; Zosh et al., 2017). However, considering the common elements of active learning approaches, certain broad strategies can be considered indicative of active learning pedagogy. These frequently include group discussions, exercises that require students to solve problems, and hands-on activities that encourage student engagement and participation (Saunders, 2020). These tactics are meant to encourage teamwork, critical thinking, and the use of information in practical situations. Additionally, technology and multimedia technologies are frequently used in active learning strategies to improve the educational process and offer chances for self-directed learning. In general, these techniques enable students to actively participate in their own education, which promotes a deeper comprehension and memory of the subject matter (Saunders, 2020).

According to Saunders (2020), active learning not only fosters a creative environment for the learner but also allows the teacher to develop their own creative abilities. As noted in the opening section, definitions of active learning can be broad, and there are many different variations. However, after gathering written definitions of active learning from more than three hundred students, Freeman et al., (2014) came up with a consensus definition that sees active learning placing an emphasis on students using higher order thinking to complete tasks or take part in class discussions (Freeman et al., 2014). They also emphasize how group projects and active learning typically go hand in hand in their definition. Students develop knowledge and comprehension as a result of active learning, which is a process that is frequently referred to as active learning. Although the tasks vary, all of them require students to engage higher order thinking (Freeman et al., 2014). Metacognition, or students' reflection on their own learning, is an essential element that creates the link between activity and learning, even though it isn't usually expressed explicitly (Abdallah et al,2023).

The core of active learning is constructivism, a learning theory that emphasizes the notion that students construct or build their understanding (Cambridge University, 2020). In his research on how children's minds grow, constructivist psychologist Jean Piaget (1896–1981) observed that each child's knowledge steadily accumulates over time. As they attempt to make sense of the world, children replace or change their existing knowledge and understanding with deeper degrees of understanding (Cambridge University, 2020). Social contact with others, such as a teacher or a learner's peers, is considered to be the main way that learning takes place, according to social constructivism. The social constructivist Lev Vygotsky (1896–1934) coined the term “zone of proximal development” (ZPD). This area, which sits in the middle of what the learner can complete on their own and what they can complete with expert assistance, should be the focus of learning activities (Cambridge University, 2020).

There are notable benefits to active learning approaches. Active learning techniques pose a challenge to the conventional, or “banking,” model of education because it assumes that students will merely listen and take notes without engaging with or critically analyzing the material (Freire, 1968). The most that students may expect from classic “banking” methods is to repeat what they learned in an exam or paper. Active learning places a strong emphasis on the student and promotes involvement, interaction, and reflection. The social constructivist learning models of Vygotsky, in which the learner constructs understanding through interaction and society, are strongly related to active learning (McLeod, 2023).

## ***Active Learning From Early Childhood to Adolescence and Beyond***

Less focus is placed on material such as text books with active learning and more on abilities, concepts, and learning how to learn (Thomas, 2009). Although active learning does entail learning material, more time is often spent on problem-solving, evaluating difficulties, and reflecting on learning than, for example, memorizing facts.

It has been established that students' cognitive, physical, social, and emotional growth can benefit from active learning. This is done by involving the students in worthwhile, practical activities that encourage critical thinking and problem-solving abilities within the ZPD. Students who take an active role in their education are better able to draw connections between new information and what they already know, which results in a greater comprehension of the material (Reuell, 2019). Additionally, active learning promotes student cooperation and communication, which supports the growth of critical interpersonal and collaborative abilities (Cambridge University, 2020). Finally, because active learning fosters a sense of ownership and autonomy in students' education, it can also benefit students' mental health by enhancing their self-esteem and drive.

Using the above ideas, incorporating interactive games and hands-on activities can boost younger children's interest and involvement, and applying socio-cultural pedagogy, group conversations, and project-based learning can aid children in developing their critical thinking and problem-solving abilities as they enter adolescence (McLeod, 2023). Similar to this, using real-world examples and combining technology can make learning more relevant and enjoyable for adult learners. Overall, developing a dynamic and inclusive learning environment requires adapting teaching methods to different age groups. Nevertheless, certain aspects of active learning can apply to all learners. All curriculum can potentially benefit from active learning because it incorporates student participation in activities, encourages higher-order thinking, problem solving, and critical analysis, and gives teachers and students feedback on the learning process (Gleason et al., 2011). Additionally, it emphasizes the importance of students exploring their attitudes, values, and habits more and can boost students' willingness to learn and develop their skills (Prince, 2004). The teacher should focus on delivering the classroom setting that encourages students to take charge of learning, aligning course content with learning-strategy development, involving students in the purpose and process, and sharing power between the teacher and student. These aspects move toward a learner-centered instructional orientation and therefore promote active learning (Kibga et al., 2021).

To effectively promote learning via play, a combination of teacher-guided, student-led, and teacher-directed approaches is required. This encourages student agency and autonomy in their learning while also providing them with the guidance and assistance they need to make learning easier (Marshall, 2017). For instance, Marshall (2017) recognized two crucial design components of the Montessori educational approach: the learning materials and the child's self-directed interaction with them. For children to develop both their fine and gross motor abilities, toys, utensils, and other sensory elements are crucial in the Montessori classroom (Marshall, 2017). Children's independent investigation of objects serves to both improve their capacity to focus and provide the teacher observer with relevant information (Marshall, 2017).

In nursery settings, enabling active learning means fostering a stimulating atmosphere that promotes discovery, curiosity, and hands-on activities (Parker et al., 2022). The teacher should ensure that the early childhood center has a rich learning environment available. This means providing a range of toys, books, and resources that are suitable for the child's age to promote discovery and play-based learning (Parker et al., 2022). This will mean the teacher looks to encourage wonder and curiosity, encouraging children to investigate their environment and ask questions, creating opportunities for them to research and learn. Parker et al., (2022, referring to research by Zosh et al., 2017) define active learning through

play in the early years as when “children develop holistic skills by interacting with people, objects, and representations in actively engaging, joyful, iterative, meaningful, and socially interactive experiences.”

The early years teacher will also seek to encourage sensory investigation by offering sensory-activating activities like finger painting, water play, and sand play.

A complex teaching strategy that makes use of a variety of learning strategies is needed for the empowerment of active learning. It involves thoughtful task scaffolding, a deep understanding of how evaluation may be used to enhance learning, and an understanding of the need for differentiation because learners are all starting from various places (Cambridge University, 2020). The student is not expected to just learn on their own or in a group without the teacher’s assistance. Hattie (2009, p. 244) makes a distinction between the teacher’s role as an activator and a facilitator. Teachers have a crucial role as activators in leading tactics like teaching metacognition and direct instruction (Cambridge University, 2020).

This chapter will employ a range of practical examples and case studies to showcase how inquiry-based learning can be efficiently implemented in diverse educational settings. These observed instances will not only inspire educators, teachers, and practitioners but also equip them with a transformative tool to hone students’ hunger for knowledge that can enrich their lives in different ways. Finally, this chapter will assist educators and practitioners in motivating learners and arousing their interest in the subject they are studying. They will be able to design dynamic learning environments that will deeply strengthen students’ engagement and improve their learning outcomes.

This chapter delves into the definition, principles, benefits, and impacts of active learning on students’ physical, social, cognitive, and emotional development. It also discusses practical pedagogical approaches for learners of different age groups and how to implement active learning, especially during the early years.

## **ACTIVE LEARNING IN EARLY YEARS: EMPOWERING CURIOUS MINDS**

Like other children his age, Ahmad, a nine-month-old, exudes inquisitiveness in almost everything he sees or does. For him, nothing is less than a discovery and exploration. From crawling in his room to riding in the garden in his pram, his eyes gleam with curiosity, and he typifies a great adventurer seeking to explore the entire world under the sun. Ahmad’s budding mind considers the world a vast playground, giving him enough scope to unravel different wonders.

No object can escape Ahmad’s attention. His tiny hands are like a flowing river, finding its way through meandering pathways. His curiosity skyrockets as he touches, feels, smells, and tastes different objects under his reach. His excitement with as simple things as a soft toy aptly displays the innocent side of the world. He cranes his neck out of the window to see the outside world, tries to climb a stool to touch an object otherwise beyond his reach, and jumps to his best on hearing the jingle sound of the bell. He profoundly seeks to understand the world around him. He perfectly scans the surroundings while roaming freely in his room, which is a whole world to him. He grasps and absorbs the detail like a deft researcher looking to investigate a critical economic phenomenon, a debilitating international event, or something like that.

While moving, several things catch Ahmad’s attention. It can be anything from a set of building blocks to pieces of clay and rattle toys. He pours all his imagination into building towering structures from blocks, molds clay to birth different creatures of his vision, and takes delight in creating music of the other world from rattle toys. The best part- he finds joy in everything- he bursts into laugh on seeing

## ***Active Learning From Early Childhood to Adolescence and Beyond***

his structures falling off. Unfazed, Ahmad quickly starts with a more sincere gaze to put back the fallen blocks in some different format.

Ahmad's limitless thirst to discover the world is fascinating. His readiness to learn and explore things and make sense of this world shows his innate insatiable curiosity, which is usual with children his age. His curiosity is the cornerstone of his actions, and addressing it is the stepping stone to developing his understanding of the world. His caregivers and teachers are aware of this crucial developmental phase in Ahmad's life, where his brain is forming connections at a fast pace. His brain behaves like a sponge, absorbing and retaining the information, laying the groundwork for further learning.

Thus, it is crucial to provide children with the right environment to spark and nurture their curious minds (Abdallah & Abdallah, 2023). Instead of obstructing them, efforts should be in the direction of fanning their keenness and tendency to ask questions and find answers for themselves. In this sense, learning should not be limited to grasping only established things and concepts. It is also related to developing the capabilities to discover and the innate desire to connect with the surrounding world. Several students find learning challenging, especially when they do not find knowledge relevant to their unique experiences. Content-heavy courses can distort motivation by making students feel overburdened. It also reduces the scope of self-directed learning.

It is a well-known fact that children are curious by nature. They want to delve deep into everything they see, touch, or feel. Their imagination is beyond limits, and their minds can go unbridled in any direction, seeking information that makes enough sense to them. Learning should empower these budding minds by fostering their sense of inquiry. Nurturing this art will allow them to brainstorm and employ the habit of analyzing things in all possible ways. These skills are necessary to sustain in the modern world, where everything has become intricate enough, requiring exploring closely intertwined underlying associations.

These pre-school years are the years of play, where the child will experience social learning, develop an understanding of language, and begin to understand the world around them. Parker et al., (2022) note that a core impediment to implementing learning through play is the perception of a pedagogy that applies only to the preschool environment and becomes obsolete by primary school. There is then a shift in the language used for "active learning" in the primary school to achieve legitimacy (Parker et al., 2022).

In the early years, Vygotskian thought implies that social interaction will be the key to the learning process (Vygotsky, 2004). To provide that interaction and deliver a learning environment that shows developmentally appropriate learning opportunities for the complete development of the child's potential, active learning in early childhood is crucial (Ozby, 2022). According to Stephen et al., (2010), children learn by forming new understandings through interactions with objects, peers, adults, ideas, and evolving events. Thus, active learning relies on the active use of resources (such as toys, natural resources, and other materials) in the learning environment (Ozby, 2022). Children manipulate objects with their hands and senses to begin active learning in the pre-school years (Goodwin, 2008). Children learn directly and concretely through the experiences they have when interacting with objects (Goodwin, 2008). Additionally, active learning involves both mental and physical effort, which includes interpreting this engagement with objects in order to produce new information. For learning to occur in this setting, the availability of peer or adult support that increases the learning experience that starts with interacting with items is also crucial (Klein, 1991). The ability to learn comes from within the youngster; the child's interest and curiosity inspire him to learn and comprehend new things (Ozby, 2022).

Active learners are explorers who use their interest and curiosity to ask questions and conduct investigations. These children make decisions about what to do in active learning environments based on their

own interests and preferences. They decide what materials to use and what to accomplish in accordance with this decision, and then they make discoveries utilizing all of their senses (Ozbay, 2022). The Ozbay (2022) research was a qualitative research project that involved interviewing pre-school teachers in Turkey about their perceptions of active learning.

Empowering the minds of the preschoolers was considered possible through experiential learning and active use of the senses in the learning process. Although the physical classroom environment could inhibit understanding, “learning by doing and living” was emphasized by preschool teachers as part of the active learning process (Johansson and Sandberg, 2010; Ozbay, 2022). Ozbay (2022) came to the conclusion that most people define learning in preschool as acquiring knowledge through interactions, experiences, and play. In research that would support those conclusions, Pramling-Samuelsson and Johansson (2006) suggested that youngsters should take an active role in the learning process, with their life experiences serving as the catalyst for their learning process. When “learning by doing and living” is incorporated into the active learning process, the findings of these studies (Johansson and Sandberg, 2010; Ozbay, 2022; Pramling-Samuelsson and Johansson, 2006) are paralleled in the nursery classrooms, where the children are actively participating in the learning, choosing activities, and drawing on their culture and experiences.

The young mind is empowered through the activities available to support learning, such as the dressing up area and the home corner, which are presented for children to take part in imaginative play (Scharer, 2017). Children begin to exhibit a keen interest in the adult world and a desire to fit in around the age of 3. As this wish cannot be instantly delivered (i.e., they cannot suddenly be a firefighters or physician), children pretend to enter the adult world through pretend play and the pretense of community relations through dramatic play (Karpov, 2003). Children can make-believe since they begin to tell the difference between the visual field and the field of sense, creating meaning, according to Vygotsky (1978).

Through pretend play, a child can decontextualize meaning, which means they are developing the ability to think of something even when it is not there (Smidt, 2009). Play separates mind and object, and action arises from thoughts rather than authentic things. For example, a stick can be transformed into a horse, and a piece of wood can become a doll. These have been aspects of childhood since the earliest times, and medieval pictures exist of children involved with pretend play, playing horses, or using their bodies in physical play. Play shows the child’s relationship to the actual, concrete situation, and as a result, the child starts to follow rules based on ideas rather than objects (Vygotsky, 1978). Play, with accompanying imagination and role-play, according to Vygotsky, is the first step in the development of higher mental functions and linguistic thinking, which are crucial for children as they enter school. Play reveals the child’s relationship to the actual, concrete situation, and as a result, the child starts to follow rules based on ideas rather than objects (Vygotsky, 1978).

This section has shown how, in various forms of active learning, the following section will link this with the developmental milestones of young children.

Developmental milestones are a set of goals or junctures that a child is expected to attain as they grow (Alkaabi, 2023; Misirliyan et al., 2023). Fine motor, verbal, cognitive, social-emotional and behavioral, and gross motor are the five divisions. It may be simpler for the educator to notice delayed development if they are aware of and understand the developmental milestones, allowing for early intervention and improved outcomes (Misirliyan et al., 2023).

How well a child develops during their first few years of life can affect their long-term development and likelihood of success in adulthood. Both parents and schools play a critical role in identifying developmental delays and recognizing normal development (Misirliyan et al., 2023). The education provider

## ***Active Learning From Early Childhood to Adolescence and Beyond***

should explain to the caregiver the developmental milestones that should be expected of their child as they grow and indicate any concerns as they arise.

Anyone writing on developmental milestones in education almost has to note the work of Piaget; his work on cognitive development shows how cognition develops from early childhood through adulthood. The stages of development are: sensorimotor (0–2 years), Preoperational (2–7 years) Concrete Operational (7–11 years) and Formal Operational (12+ years) (McLeod, 2023b).

Piaget differed from the concept that intelligence was a static characteristic and supposed that contextual influences and biological maturation were what led to cognitive development. Children’s ability to grasp, consider, and solve environmental challenges develops in a stop-start, discontinuous manner as opposed to gradual modifications through time (McLeod, 2023b). Since Piaget lays a greater emphasis on development than learning as a whole, he does not discuss the acquisition of knowledge or specific acts.

The idea that children actively contribute to and influence their own learning and build knowledge via actions and interactions with adults and peers characterizes a large portion of preschool thought on learning (Stephen et al., 2010). In the recommendations for best practices for nursery settings, the significance of what is variably referred to as experiential learning—learning via play, exploration, or activities—has long been highlighted (Stephen et al., 2010). It is also strongly ingrained in the strong, implicit, and frequently held beliefs about preschool practice that early childhood pioneers like Isaacs (1932) and Montessori (1966) advocated. These beliefs can be connected to the emphasis on the value of immediate, first-hand experience and children making their own decisions about the activities they choose to engage in (Stephen et al., 2010). The High/Scope program promotes what it calls “active learning,” saying that children acquire new abilities through engagement with real-world items, dialogues with other kids, and self-reflection. It is well-known in the USA, particularly in contexts for poor children (HighScope, 2023). This method places a strong emphasis on the value of exploration and play in the learning process. Children learn to create connections, recognize patterns, and exercise critical thinking by participating in hands-on activities. Additionally, the curriculum promotes children’s cooperation and idea sharing with their friends since it stresses the importance of social connections in learning (HighScope, 2023). As a final benefit, children who reflect on their own behavior become more conscious of what they are doing and are better able to choose their activities, supporting both their social and personal growth.

Utilizing hands-on activities, such as sensory play and experiments, to pique young children’s curiosity and encourage inquiry are some practical techniques to engage young children in active learning experiences from an early age (Lee, 2016). A love of active learning can also be fostered by creating a stimulating learning environment with vibrant visuals, adaptable seating options, and learning centers that appeal to various interests. Younger children can be encouraged to interact with the environment and to touch and feel the materials in the classroom. They gain both fine and large motor skills as a result. The classroom should revolve around encouraging a mindset of curiosity by offering novel experiences, objects, and settings that can cultivate awe in the young. The teacher will also use narratives and storytelling, as storytelling can help children improve their verbal skills and imagination.

## **ACTIVE LEARNING IN PRIMARY SCHOOL: EXPLORING THE WORLD AND FINDING ANSWERS (6–10 YEARS)**

In recent research, Michael et al., (2023) showed that by the primary school age, active learning is not adequately understood by teachers. However, Michael et al., (2023) record how teachers have consis-



tently demonstrated a strong sense of optimism and confidence in their ability to provide the benefits of active learning in their classes. The research outcome showed that teachers, regardless of gender or educational level, had different understandings, practices, and efficacies of active learning (Michael et al., 2023). The most frequent issues cited by instructors included a heavy workload, sizable class sizes, a lack of teacher motivation, brevity of class periods, the subject matter they were teaching, a lack of school policies governing the use of active learning strategies, and an inadequate level of expertise and understanding in this area (Michael et al., 2023). These were all identified as inhibitors for successful active learning pedagogy. The results of this study suggest that there is a need to improve teachers' knowledge of active learning and to give them ongoing assistance so that they can employ active learning even in difficult circumstances.

Taking research from the COVID time period, the Science journal published findings that indicated there were real benefits from moving away from traditional learning approaches to more “active participatory” pedagogy (Yannier et al., 2021). The Yannier et al., (2021) study showed that primary-age children do benefit from being placed in the “driving seat” through discussion-based teaching (Yannier et al., 2021). Strategies from teachers need to engage the children so that they do not begin the drift from learning that can gain traction in later years. Active learning at this stage of education is shown to have positive benefits for cognition as well as providing socioemotional support (Yannier et al., 2021) For example, in a primary classroom, instead of the traditional teacher speaking from the front, the teacher can facilitate group discussions where children actively participate and share their ideas (Luzet, 2013). This not only enhances their cognitive skills by encouraging critical thinking and problem-solving but also promotes socioemotional development as they learn to listen, respect others' opinions, and communicate effectively. Following Vygotsky, “the one who does the talking does the learning” (Luzet, 2013, 16). Furthermore, collaborative learning environments promote teamwork and cooperation among students, which are valuable skills in both academic and real-world settings. By working together in groups, students learn how to negotiate and compromise, fostering their ability to work effectively with others. Additionally, engaging in discussions and sharing ideas allows children to develop their communication skills, both verbally and non-verbally, which are essential for building relationships and expressing themselves confidently. Overall, incorporating interactive, active learning, teaching methods in classrooms not only improves cognitive abilities but also nurtures social and emotional growth in students (Luzet, 2013)

Parents, teachers, and caregivers must be aware of the developmental traits and milestones of children between the ages of 6 and 10. Children develop significantly in their physical, social-emotional, and cognitive dimensions at this stage. They begin to hone more complex problem-solving abilities, acquire better motor and coordination skills, and increase their level of independence in daily tasks (Healthwise, 2022). They also start to develop deeper friendships and comprehend empathy, laying the groundwork for their future social relationships. This is Piaget's concrete-operational stage, where a 7-year-old child, for instance, might come across a difficult arithmetic problem at this point and utilize their problem-solving abilities to break it down into smaller parts and come up with a solution on their own. They might also join a team for a sport, honing their coordination and motor abilities over time through practice and instruction. They may actively participate in group activities with their friends, show empathy by consoling a friend who is distressed, or share toys with others as they develop socially (Healthwise, 2022).

Learning Styles have been exposed as a learning myth (Holmes, 2016), even though they continue to gain plenty of academic attention and even academic books are still published where they are taken as factual (Pritchard, 2013). Given that there is very little solid academic credibility for the idea that different children can learn kinaesthetically, visually, auditory, etc. Nearly everyone mixes learning

## ***Active Learning From Early Childhood to Adolescence and Beyond***

styles as required (Holmes, 2016), although some children with special needs may show a preference out of necessity - for example, a visually impaired child will need more auditory learning resources. Before looking at connecting learning styles to active learning, the cautionary note applies that although 96% of teachers are reported to believe in learning styles, they are dismissed in nearly all academia as “nonsense” (Dodgson, 2018).

However, if the planning of active learning opportunities must take children’s learning styles into account (and if so many teachers believe they exist, then they may include them in the planning). Teachers can better fit their teaching strategies to the needs of certain students by being aware of the many ways that children receive information.. For all students, educators may create a more inclusive and productive learning environment by identifying and addressing specific resources for lesson delivery. For instance, if a child is a “visual learner,” a teacher can give them visual aids like diagrams or charts to aid with understanding and memory. Furthermore, adding movies or multimedia presentations to classes might improve students’ comprehension and engagement. The instructor may make sure the youngster is actively engaged in the learning process and properly absorbing knowledge by catering to their preferred learning style.

We are currently schooling a generation that appreciates visual media, games, music downloads, and playing on mobile devices. There is a risk that as education changes to fit the young people entering the classroom, it may become disconnected from how children acquire learning at home. Therefore, in order to involve children in hands-on learning activities, educators are looking to new cutting-edge approaches, such as gamification. Gamification is the process of adding game design and mechanics into educational programs to increase their interactivity and student enjoyment (Sailer et al., 2017). Gamification is a method of enhancing learning by allowing teachers to take use of childrens’ inherent interest in video games and technology. This method encourages critical thinking, problem-solving, and teamwork skills, which are crucial for success in the contemporary world (Sailer et al, 2017). It also helps to close the gap between how children learn at home and in school. For instance, a math teacher could design a gamified course where pupils level up and get points for accurately and swiftly solving equations. In addition to encouraging children to practice their arithmetic skills, this also enables real-time feedback and progress monitoring. The game might also have cooperative components, such as team challenges or leaderboard competitions, to encourage children to work together and engage in healthy competition (Selawsky, 2021). It is reported that a student’s self-confidence can rise by up to 20% thanks to gamification. It boosts task completion by 300% while improving memory retention of new information by 90% (Selawsky, 2021) Additionally, game-based learning increases practical knowledge by 20% and conceptual knowledge by 11% (Selawsky, 2021) We have been playing games as a natural way to learn ever since we were young children. In lieu of reading textbooks and attending lectures, they provide ways to learn in a fun and easier way, assisting the process by making learning motivational and interesting. This can be seen as an extension of the earlier endorsement of play by theorists such as Vygotsky, and rather than leave play outside the classroom, its motivational benefits can be harnessed by staff instead.

## **ACTIVE LEARNING IN MIDDLE SCHOOL: EMPOWERING STUDENTS TO NAVIGATE THEIR LEARNING AND GO BEYOND EXPECTATIONS (6–10 YEARS)**

With children in middle school between the ages of 11 and 14, active learning is about giving pupils the tools they need to succeed academically. This stage of learning builds on previous learning and makes

### ***Active Learning From Early Childhood to Adolescence and Beyond***

use of technology, group discussions, and collaborative learning to improve education and learning. For instance, as part of a project-based learning activity, students in an active learning environment might study and develop a presentation on a historical event. They are urged to collaborate, talk about their research, and use technology tools like online databases and multimedia programs to improve their comprehension and presentation abilities. With multimedia, children can be at any historical site worldwide, and VR can help you experience walking on the moon or walking around the Smithsonian Museum and looking at exhibits and sources (Smithsonian, n/d). This practical method helps students develop their critical thinking, problem-solving, and teamwork skills, in addition to deepening their knowledge. In order to replicate the historical event, the active learning classroom may also use role-playing games and real-world simulations. This enables students to actively engage and become immersed in the situation, acquiring a deeper knowledge of the significance and effects of the event. When necessary, the teacher acts as a facilitator, facilitating dialogues and encouraging student autonomy and ownership of their own learning (Luzet, 2013). Overall, this classroom's active learning strategy fosters a lively, stimulating learning environment that equips students for the challenges of the twenty-first century (Luzet, 2013).

Children in middle school have already developed a number of social and emotional competences (self-awareness, self-management, social awareness, relationship skills, and responsible decision-making abilities) throughout their time in early childhood and elementary school. Since young people are also undergoing many developmental changes and beginning to confront more challenges, such as increased peer pressure and academic pressure, these years are critical for social and emotional development. (NCSSLE, 2022).

Students in middle school are starting to comprehend and interact with increasingly complicated emotions and social circumstances. Young people are developing their peer networks, learning how to deal with group dynamics, and resolving disagreements as youngsters become more independent from adults. They are also becoming more confident in their sense of self, which includes their personal values and interests as well as their sense of collective identity. (NCSSLE, 2022). Middle school children are developing their critical thinking skills as well as their capacity for in-depth reflection, impact analysis, and decision-making after carefully weighing many factors (NCSSLE, 2022). For instance, middle school students might look up and evaluate scientific information, economic ramifications, and social effects before forming their views during a class debate on climate change. They would then use their critical thinking abilities to assess the probable effects of various policies and come to wise judgments about how to deal with this urgent situation (Abdallah et al, 2023). These children enhance their critical thinking abilities while also becoming well-informed citizens who can make wise decisions by participating in such thorough and careful procedures. They are able to constructively contribute to debates and offer practical solutions because they have the capacity to delve deeply into complex problems and assess multiple viewpoints. Furthermore, developing these abilities at a young age provides a solid basis for their future aspirations because they will continue to apply critical thinking in all facets of their personal and professional lives.

Middle school students often engage in active learning through inquiry-based instruction. For instance, in a science lesson, rather than just sitting and listening to a lesson about the water cycle, and looking in the text book, students are given a hands-on project where they build their own version of the cycle using materials like plastic containers, heat sources, and water. Following that, the middle schoolers are encouraged to make observations, ask questions, and analyze their findings in order to develop critical

## ***Active Learning From Early Childhood to Adolescence and Beyond***

thinking and involvement. Due to their active participation in the learning process, students who engage in this kind of active learning are able to comprehend the subject matter more deeply as it involves discussion, collaboration and group work (Luzet, 2013). As they develop their own models, it also fosters creativity and problem-solving abilities. Students' engagement and sense of ownership over their learning increase when inquiry and discussion are encouraged, providing for a more pleasurable and fruitful educational experience (Luzet, 2013). This is all supported by the Vygotskian theories of social learning.

In middle school settings, technology is an indispensable tool for encouraging active learning. For instance, teachers can use interactive whiteboards to get students involved in group problem-solving exercises where they can interact with virtual objects and practically explore ideas. Online discussion boards and educational apps can also motivate students to actively participate in in-class debates and research projects, which will help them understand the material better. Additionally, technology enables students to access digital resources suited to their particular needs and interests, allowing for personalized learning experiences (Major et al, 2021). This not only increases their desire to learn but also gives them the freedom to advance at their own pace. Technology also gives students the chance to interact with real-world professionals, go on virtual field trips, and take part in simulations that mimic real-world scenarios (Major et al., 2021). Overall, technology gives students the power to take charge of their education and equips them with the skills they need to succeed in the digital age.

The importance of discourse in learning cannot be overstated, according to the literature on socio-cultural learning (Luzet, 2013). As aforementioned, Vygotsky was supporter of group work and collaboration in the classroom, and in middle schools, collaboration and group work are frequently included in teacher lesson plans. Collaboration allows for the development of many different areas of learning, including peer marking and evaluation, designing presentations, and raising student involvement. For instance, during a science experiment in a middle school, pupils are divided into small groups. They share their findings, examine the facts together, and draw conclusions through collaboration and debate (Luzet, 2013). Along with improving their communication and critical thinking skills, this helps them better understand scientific concepts. Peer marking and evaluation also give students the chance to give comments to their classmates, assisting them in identifying areas for development and solidifying their own knowledge of the subject (Bataineh et al., 2022; van Gennip et al., 2010). Students have the chance to conduct research and convey material in a clear and succinct manner while strengthening their public speaking abilities through the process of creating presentations. Teachers can improve student engagement and promote a collaborative learning environment that supports academic growth and development by actively involving students in these activities.

In summary, this part examined how technology and multimedia are being used more and more to promote active learning methodology. In the middle school, students are becoming more and more confident in their abilities to collaborate socially, evaluate one another's work, and study efficiently using technology. Middle schools' transition to collaborative learning and technological integration has been shown to be very advantageous for student engagement and academic advancement (Al-Bogami & Elyas, 2020). Students gain crucial social and communication skills that are necessary in the current workforce by actively participating in group assignments and giving feedback to their peers. Additionally, a more interactive and individualized learning environment that makes efficient use of multimedia and technology allows students to explore and understand difficult ideas.

## **ACTIVE LEARNING IN SECONDARY SCHOOL: CULTIVATING LIFELONG LEARNING (15-18 YEARS)**

In secondary school, active learning involves encouraging lifetime learning. Exam pressure will be present at this time, and students may be considering their future occupations and way of life. Even so, learning goes on, and new approaches to active learning are appropriate for older teenagers. Active learning, for instance, might involve secondary school students taking part in internship or work shadowing opportunities to obtain practical experience and explore potential future choices (Van Wart et al., 2020). Additionally, they can participate in project-based learning, where they collaborate to find solutions to challenging issues or research interesting subjects. This kind of learning fosters curiosity, which can result in lifelong interests and passions for learning (for instance, a love of history in school may result in a lifetime of reading and visiting historical sites). Students can learn vital skills like critical thinking, problem-solving, and effective communication through these practical experiences (Snyder and Snyder, 2011). Students can have a greater grasp of how their academic knowledge might be utilized in real-world problems by actively participating in real-world scenarios. This may ultimately result in a more comprehensive education and better position them for future employment.

The educational needs of older teenagers alter dramatically by the time they enter adolescence. At this point, individuals need to take more challenging and specialized classes to get ready for their future employment. Additionally, they yearn for greater autonomy and independence in their academic pursuits, looking for chances to pursue their own interests and ambitions. Additionally, older teenagers benefit immensely from direction and assistance in acquiring vital life skills like critical thinking, problem-solving, and effective communication as they approach adulthood (Backes and Bonnie, 2019; Alqodsi et al., 2023). An in-depth illustration of the input may be a high school that offers specialized tracks or professional pathways that let students concentrate on subjects important to their future employment. They would acquire advanced knowledge and abilities in these disciplines if they chose options like engineering, medicine, or business. The school could also start mentorship programs or extracurricular pursuits that encourage youngsters to develop their independence and pursue their own interests. This all-encompassing strategy would provide the required academic support and preparedness for life.

All high school teachers strive to get secondary students involved in planning and directing their own learning, and this stage of education enters the frame for constructivist theory, learning becomes an active process where learner experience matters even more. The ultimate objective is to help older children become independent learners. For instance, a teacher at a high school might open the home study, where students are free to select their own research questions, create their own timelines, and present their findings in interesting ways. This strategy not only encourages autonomous thinking and decision-making abilities in students, but also enables them to take charge of their education and gain a deeper comprehension of the material. Students become more engaged and motivated to learn when given this level of autonomy. They now actively participate in their own education rather than being passive recipients of information. This is constructivist theory of learning, where education is driven by ‘an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner’ (Elliott et al., 2000, 256). Furthermore, this strategy gets children ready for the real world, where they will have to be self-reliant and capable of making their own decisions, the learner has reached the level where they are actively constructing meaning themselves. Ultimately, teachers are giving their pupils the tools they need to flourish outside of the classroom by encouraging learner freedom.

## ***Active Learning From Early Childhood to Adolescence and Beyond***

By assigning lectures or other learning materials to be examined outside of class, the flipped classroom model enables more engaging and hands-on activities in the classroom (Grotzer, n/d). Teachers can give students the information they need in advance using technology, such as online videos and tools, so that they can arrive at class prepared to participate in discussions and group projects. This method encourages pupils to participate actively in their education and fosters the growth of critical thinking abilities (Grotzer, n/d). By giving students the chance to direct their own learning, we can help them become agentive learners, learners driven by the desire to find out, a genuine wonder at the discovery element of teaching. Student-centered projects and activities can be incorporated into the curriculum to provide students with more freedom to choose, define objectives, and be accountable for their education. Students are more motivated and committed to their education when they have a sense of agency, which results in greater knowledge of the material and greater achievement in general.

Meeting a student years later to see if anything they taught has stuck with them is one approach for teachers to gauge their achievement. When an English teacher meets with a former student at the theater, for instance, they hope it is because part of what they did in the classroom has stayed with them. This may manifest itself in the student's appreciation of the arts and literature, their capacity to evaluate performances, or even their ongoing enthusiasm for the English language. Teachers can genuinely assess the impact they have had on their students' lives through these interactions, and they also feel a sense of fulfillment knowing that their efforts were not in vain. Learning will not end at the school gates if enthusiasm and passion for a subject has been passed over.

## **CONCLUSION**

If teaching has energized the learner, they will carry the principles of active learning with them for the rest of their lives. Active learning does not simply belong in the classroom. For instance, a student who actively participated in practical science experiments during their academic years may continue to look for chances for scientific exploration and discovery outside of the classroom, such as joining a local science club or carrying out independent experiments at home. Beyond the confines of typical educational settings, this lifetime quest for knowledge and active learning can significantly improve their comprehension and enthusiasm of the subject. These students might also develop a strong interest in the subject, which might inspire them to pursue graduate degrees or professions in the area. Early participation in experiential learning can help children develop the information and abilities that will lay a solid foundation for future academic and professional success. These people might also develop into important members of the scientific community who persistently push the boundaries of knowledge and make important contributions to their respective professions. In the end, experiential learning has an impact on individuals' lives and the world around them that goes well beyond the classroom.

Bruner's idea of learning scaffolding demonstrates how a teacher may support a student's development and eventual independence (McLeod, 2022). For instance, in a math lesson, a teacher would first provide a student step-by-step direction and assistance in solving challenging equations. The teacher gradually lessens their aid as the student builds confidence and proficiency, enabling the learner to complete identical equations on their own in the future. The same learner may utilize these abilities to manage wages for others, run a business, and file taxes in the future. The teacher enables the pupil to become independent and capable of doing more difficult tasks by progressively reducing their support. This method helps students develop their independence and critical thinking abilities, preparing them

for difficulties in the real world. In time, the learner will be able to use these problem-solving abilities in many areas of their life, including handling money, making wise decisions, and overcoming obstacles at work. This whole piece of work on active learning has shown the learner develop from the early years activities of play into a mature independent learner, with the teacher increasingly providing less and less structured scaffolding to hold them. In the end, this guided development process gives pupils the skills they need to successfully negotiate the world's ever-evolving complexities.

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# Chapter 3

## Active Learning: Strategies for Engaging Students and Enhancing Learning

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### ABSTRACT

*This chapter introduces active learning and how students in various educational settings can best acquire, apply, create, and share knowledge. The chapter presents multiple forms of active learning that have been documented in the literature and deemed imperative to increase student engagement and deepen their understanding. The chapter also discusses the various perspectives concerning the implementation of active learning strategies in various educational contexts. A particular focus is given to the significance of metacognition as a critical skill that enables students to assess their own learning, and to critically assess sources of information. The chapter presents several suggested active learning strategies that are easy to implement in any classroom setting and are useful to connect classroom instruction, assessment, and management together.*

### INTRODUCTION

Active learning encompasses any learning style that necessitates both physical and mental engagement with the content or materials. This approach is grounded in constructivist theory, which advocates for engaging learners in hands-on and minds-on activities to enhance and optimize their learning experience (Wadsworth, 1996). Over the past few decades, active learning has surged in popularity in response to various calls for educational reform, such as those from the National Institute of Education (NIE). The central tenets of these reforms have been to foster increased student participation, promoting active teaching methods, and encouraging students to assume more responsibility for their own learning (National Institute of Education, 1984, p. 38). The adoption of active learning strategies and techniques has been further underscored in a number of recent educational initiatives and documents (National Research

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Council, 2012). This chapter will explore the foundational theories of active learning and present practical classroom techniques that can be seamlessly integrated into any educational environment. Additionally, it will examine potential challenges in incorporating these methods into classroom practice. The chapter will conclude with a selection of common active learning approaches and techniques.

## **DEFINING ACTIVE LEARNING**

Active learning involves engaging learners in interactive tasks, both physical and mental, such as role-playing, discussing tasks, and conducting experiments. This approach contrasts with passive learning, where learners are not actively involved in learning activities. Passive learning examples include listening to lectures or watching demonstrations, where learners are passive recipients of information. Bonwell and Eison (1991) described active learning as an instructional method that “involves students in doing things and thinking about what they are doing” (p. iii). Essentially, active learning involves activities beyond reading, listening, or watching, which deepens students’ understanding and connection with the material. It encourages learners to engage in metacognitive thinking and reflection on their learning practices.

Furthermore, active learning occurs not only with individual learners but also in group settings. For instance, the “Think-Pair-Share” technique prompts individual learners to think independently before sharing their thoughts with peers and groups. Active learning can also extend beyond the classroom. Learners might explore real-world challenges faced by their school’s counsellor or engage in service-learning activities related to specific assignments. However, this chapter primarily focuses on instructor-designed active learning in settings like classrooms, workshops, and webinars, which are more common experiences for educators.

## **WHY ACTIVE LEARNING MATTERS**

Constructivism, widely recognized as a prominent learning theory, posits that effective learning occurs when learners actively engage with specific activities to develop their thinking. It is essential for learners to have opportunities to discuss their ideas with peers and reflect on their learning experiences (Wadsworth, 1996). Proponents of constructivism, such as Bransford et al. (1999), have maintained that learners construct their own knowledge and understanding, necessitating active engagement with information to generate new meanings, interpretations, and understandings. Social constructivists, notably Vygotsky (1978), have underscored the significance of interactions with other learners in the construction of knowledge. According to these theorists, learners enhance their understanding by recalling prior information and integrating it with new knowledge. The motive to adopting active learning strategies in this century is for the many benefits that this strategy brings to learners. One of these benefits is to bridge the skill gap – or the prediction that there will be insufficient talent to meet the global demands for employment in the 21<sup>st</sup> century. Olson and Peterson (2015) stated that the global market in the 21<sup>st</sup> century would witness great demand for skilled workers who were characterized by having certain skills that enabled them to effectively contribute to the development of their national and global economies. The authors also stressed the need to provide future graduates with sufficient vocational training and education to bring real change to their lives (Olson & Peterson, 2015).

## **Active Learning**

Cukier (2016) contended that education should address the perception gap that may exist for future graduates. In his study, Cukier compared the self-assessment of Canadian graduates' skills with the evaluations provided by their employers. He discovered a significant discrepancy: while graduates rated their communication skills above 90% proficiency, their employers perceived them as only 50% proficient. Additionally, Canadian employers reported that less than 25% of newly hired graduates possessed the required proficiency in digital tools (Cukier, 2016). These findings underscore the necessity for students to acquire a broad range of skills and competencies needed in the future job market. Prince (2004) suggested that to develop these essential skills, students required opportunities to practice them in classroom settings that utilized active learning strategies, such as project and problem-based learning methods.

The literature documents several advantages of implementing active learning strategies in schools. Freeman et al. (2014) noted that active learning enhanced student success, with students performing better on exams and being 1.5 times less likely to fail than those in traditional lecture-based classrooms. Eddy and Hogan (2014), along with Haak et al. (2011), argued that active learning narrowed the achievement gap for underrepresented student populations, including minorities. This may be attributed to students feeling more personally invested in the material and their own learning when actively engaged (Svinicki, 2014). Additionally, active learning fosters inclusiveness by encouraging learners from diverse backgrounds to share and discuss their ideas. These methods and strategies aid in improving learners' conceptual understanding of the material they study. Research indicates that this improvement stems from the interdependence of situation and cognition. When learning is integrated with context, learners perceive knowledge as a tool for problem-solving and developing critical thinking skills, rather than as the final product of education (Fazio et al., 2021).

Active learning strategies target learners' cognitive processes, stimulating them to think and reflect on their own learning experiences. This approach places a strong emphasis on encouraging learners to develop and enhance their self-monitoring abilities in learning (Thomas, 2009). This focus does not imply a lack of content in active learning; rather, more time is typically allocated to problem-solving, analyzing issues, and reflecting on learning experiences than to memorizing rote facts. For instance, when learners were asked to respond to the statement "I used to think, but now I know," they were given the chance to assess their learning and monitor their progress throughout the lesson (Thomas, 2009). This opportunity allowed them to identify their weaknesses and strategize on how to address them in future learning stages.

In summary, the ongoing changes and evolution of future needs indicate a necessity to transform teaching and learning in schools, making it more personalized and tailored to develop the capacities of individual students. In order for this transformation to occur, teachers must adopt a repertoire of active teaching approaches. It is essential to recognize that the change is not limited to teachers altering their teaching methods; students also need to develop their self-assessment and metacognitive skills to become reflective lifelong learners. Furthermore, students should actively participate in shaping their own learning environments and contexts.

## **APPROACHES OF ACTIVE LEARNING**

Studies highlight that active learning does not adhere to a single theory or set of practices. It is considered an umbrella term that includes a variety of teaching and learning approaches and a broad spectrum of specific techniques. Prince (2004), for instance, identified three common active learning approaches:

collaborative learning, cooperative learning, and problem-based learning, each with distinct applications and implementations. Collaborative learning involves learners working together on a project towards a common learning outcome. Cooperative learning, while also collaborative, emphasizes individual progress in conjunction with others, fostering more inherent interdependence and accountability. Problem-based learning presents students with real-life problems to solve, typically being self-directed with the instructor serving as a facilitator rather than a direct provider of answers.

Cattaneo (2017) categorized active learning activities into problem-based, discovery-based, inquiry-based, project-based, and case-based learning. She noted that while these approaches were student-centered, they varied considerably in their implementation. In another study, Graffam (2007) outlined three components of active learning: intentional engagement, purposeful observation, and critical reflection. Intentional engagement involves hands-on practice where students undertake specific investigations to acquire desired skills. In purposeful observation, learners observe a demonstration or scenario to learn skills, knowledge, or procedures. For instance, observing an interview can teach students interviewing techniques and question formulation (Darawsheh et al, 2023). The key difference between demonstration and purposeful observation lies in the role of the learner: in demonstrations, the instructor guides the learning process, whereas in purposeful observation, learners take full responsibility for their learning. Lastly, critical reflection, a metacognitive activity, enables students to contemplate their own thinking and critique their learning practices to enhance them. Metacognition is vital as it helps students to interconnect their knowledge and deepen their understanding.

There is considerable support for active learning in the literature, but the crucial question remains: does this approach effectively engage students and enhance their learning? Bonwell and Eison (1991) asserted that students in active learning environments were more engaged and motivated than those who merely passively listened to lectures. They also argued that active learning fostered higher-order thinking skills like analysis, synthesis, and evaluation, in addition to mastering the same content as in lectures. The data supporting the efficacy of active learning, as opposed to traditional transmission methods that rely on “teaching by telling,” are substantial and span over three decades. In a comprehensive meta-analysis of 225 studies within STEM disciplines, Freeman et al. (2014) focused on the design of class sessions (excluding out-of-class work or laboratories) and compared those incorporating elements of active learning against traditional lecturing. Their results were compelling: students in traditional lectures were 1.5 times more likely to fail (odds ratio of 1.95,  $Z = 10.4$ ,  $P < 0.001$ ).

Additionally, the integration of active learning into course design typically led to significant improvements in student performance on exams, concept inventories, and other assessments, with an average increase of approximately half a standard deviation (weighted standardized mean difference of 0.47,  $Z = 9.781$ ,  $P < 0.001$ ). These positive impacts were consistent across a range of STEM disciplines, including biology, chemistry, computer science, engineering, geology, math, physics, and psychology. Several studies specific to STEM classrooms have documented small but measurable gains for students (Haak et al., 2011; Koohang et al., 2016; Smith et al., 2009; Smith et al., 2011; Walker et al., 2008). Moreover, in a targeted review, Ruiz-Primo et al. (2011) examined published studies assessing the impact of active learning in undergraduate courses in biology, chemistry, engineering, and physics. They identified 166 studies that reported effect sizes when comparing the outcomes of innovative active learning approaches to traditional instruction lacking these elements. Their findings indicated that active learning approaches generally led to improved student outcomes, with a mean effect size of 0.47. However, it is important to consider several significant caveats in interpreting these results.

## **Active Learning**

Initially, the authors of the study categorized active learning activities into conceptually oriented tasks, collaborative learning, technology-enabled activities, inquiry-based projects, or combinations of these. Within these categories, there were notable variations in effectiveness. For example, technology-assisted inquiry-based projects did not consistently yield positive effects on average. Second, the review was primarily based on quasi-experimental studies (accounting for over 80% of the research) rather than fully experimental ones. In experimental studies where students were randomly assigned to groups, the observed benefits of active learning had a somewhat lower average effect size of 0.26. Additionally, many of the studies did not control for participants' pre-existing knowledge and abilities within the treatment groups. Despite these limitations, the review still provides conditional support for incorporating active learning approaches in teaching practices (Jandigulov et al,2023).

Smith et al. (2009) examined the impact of peer discussion on student performance in interactive learning environments and found that students generally gave more correct responses in exams when working in groups. Their research also indicated that group discussions aid in developing a deeper understanding of science concepts, even when no group member initially knows the correct answer. Importantly, they discovered that students at novice and intermediate learning levels benefited most from peer discussions supplemented with instructor explanations (Smith et al., 2011). Regarding the impact of active learning on gender, a study by Lorenzo et al. (2006) explored how active learning techniques influenced the performance gap between male and female students in introductory physics classes. Their findings showed that the use of active engagement techniques benefited all students, with the most notable improvements in female students' performance. When a significant level of active learning, or a "high dose," was implemented, it effectively eliminated the gender gap. This aligns with earlier research suggesting active learning is particularly beneficial for female students, as indicated by Laws et al. (1999) and Schneider (2001).

Koohang et al. (2016) found that basing student learning on real-world experiences and employing higher-order thinking skills enhanced student engagement. Likewise, Catalano and Catalano (1999) observed that students learning through student-centered strategies demonstrated better progress on standardized tests compared to those taught with teacher-centered methods. Prince (2004) discovered that cooperative learning enhanced students' academic performance and led to improved learning outcomes. Similarly, Hake (1998) observed that active learning led to better test scores and heightened students' problem-solving abilities. Harris and Bacon (2019), however, found that while active learning resulted in student scores at least as good as those from traditional, passive learning methods, it also fostered both lower-order and higher-order critical thinking skills. While most studies strongly support active learning, both Prince (2004) and Bernstein (2018) noted the challenges in assessing its impact due to the variety of assessment approaches and techniques. Bernstein (2018) recommended that active learning be highly structured and that it was most effective when student engagement was mandatory. He advised instructors to adopt an incremental approach to integrating active learning techniques. Generally, research indicates that active learning can lead to enhanced student performance. In the least, it yields results comparable to those in traditional learning contexts (Thomas, 2009).

## **CONCERNS AND CHALLENGES ABOUT IMPLEMENTING ACTIVE LEARNING**

Despite the effectiveness of active learning strategies being well-established, lectures remain the primary teaching method in higher education. This preference may stem from instructors' familiarity and ease



with lecturing, a method they were often taught through themselves. Summerlee (2013) highlighted that many instructors viewed lecturing as an efficient way to convey information. However, studies have shown that students struggle to stay engaged during lengthy lectures and tend to engage in more superficial learning. Summerlee (2013) also noted that students had difficulty processing information from lectures, which led to a demand for more personalized teaching approaches. Overcoming the inertia of traditional lecturing, particularly at the university level, is crucial as education involves developing abilities for complex problem-solving, decision-making, and project management, not just absorbing facts.

Boy (2013) argued that the widespread availability of information on the internet should prompt educators to reconsider traditional lecturing methods. He emphasized the need for students to engage in critical thinking about their learning methods and to be discerning about their sources of information, focusing on applying information in real-life scenarios. Bonwell and Eison (1991) cautioned that adopting active learning techniques requires patience, as initial attempts may not be successful. Instructors might resist revisiting these methods, especially if they are comfortable with lecturing. They pointed out barriers to moving away from traditional lecturing, such as the pressure to cover extensive content, unsuitable class sizes for active learning, the time required for planning, and a lack of necessary materials or equipment. To address these challenges, they suggested reducing the volume of material covered in lectures to make room for skill development and implementing the flipped classroom model to encourage interactive discussions (Abdallah & Alkaabi, 2023).

To address the barrier of costly materials for active learning, researchers have suggested using technology to alleviate these concerns. Instructors can take advantage of eLearning platform features like discussion boards, peer assessments, and conferencing tools. For active learning strategies to be effectively implemented, it is essential for both instructors and students to recognize their importance in developing 21<sup>st</sup> century skills and competencies. Additionally, allowing sufficient time for students to become acquainted before starting group work is crucial. Cohen et al. (2019) recommended letting students form their own groups for better compatibility. Keeley (2008) provided several interactive classroom strategies that integrate instruction, assessment, and classroom management. These strategies, detailed in the subsequent section, can be instrumental in acquainting educators and students with active learning methodologies.

## **EXAMPLES OF ACTIVE LEARNING CLASSROOM STRATEGIES CONNECTING INSTRUCTION, ASSESSMENT, AND CLASSROOM MANAGEMENT**

A multitude of active learning strategies exist that educators can employ in their classrooms. Keeley (2008) suggested a comprehensive list of 75 strategies that focused on essential components of classroom instruction such as teaching, assessment, and management. These strategies aimed to enhance student interaction both with the content and among themselves. Outlined below are several of these techniques, accompanied by their potential uses in an educational context:

- (1) **Frustration Model:** This method assists students in graphically organizing their existing knowledge about a concept. The model is divided into four sections, enabling students to define, describe, and illustrate examples and non-examples of the concept (Buehl, 2001).

## **Active Learning**

- (2) **I Think-We Think:** Here, students utilize a two-column sheet to jot down their individual thoughts (I Think) before a group discussion. During the discussion, they record collective ideas (We Think) generated by the group (Goldberg, Bendall, Heller, & Poel, 2006).
- (3) **I Used to Think... But Now I Know:** This strategy encourages students to reflect on and articulate how their understanding has evolved. They compare their initial thoughts at the start of a lesson with their knowledge after completing it.
- (4) **Point of Most Significance:** A rapid-response technique where students identify the key learning or idea they extracted from a lesson.
- (5) **Verbal Fluency:** Designed for partner discussions, this method involves partners engaging in timed, spontaneous discussions about a topic. While one partner speaks, the other listens, switching roles when time is up (Lipton & Wellman, 1998).
- (6) **Think-Pair-Share:** This approach integrates thought and communication. Teachers pose a question, give students time to contemplate individually, then have them discuss their thoughts with a partner. Following this, students share their insights in larger groups or with the entire class.
- (7) **Traffic Light Cups:** Used in group activities to signal the teacher about the group's need for assistance. Groups use red, yellow, and green cups to indicate their need for help or their ability to proceed independently.
- (8) **Raise Hand for Silence:** A technique to capture student attention during discussions. When the teacher raises a hand, students cease their discussion to focus on the teacher.
- (9) **Numbered Heads:** This strategy ensures active participation from all students. In each group, students are assigned numbers. To select a student for answering questions, the teacher randomly calls a number, and the corresponding student responds.
- (10) **Round Robin:** This method facilitates structured idea sharing within groups. When posed with a question, each student is allotted a specific time to express their thoughts to their group.
- (11) **Gallery Walk:** This interactive technique allows students to view their peers' work. Groups display their projects on posters around the classroom. Students then circulate to observe and read the content of other groups' posters.
- (12) **Poster Session:** Similar to the Gallery Walk, this method involves groups preparing and displaying posters. Two members from each group stay to explain their poster to others and address any questions.
- (13) **Card Sort:** In this activity, groups receive cards containing information and concepts to organize according to their knowledge and understanding. This prompts a discussion among group members to justify their arrangement of the cards.
- (14) **Fold and Pass:** Students write their responses to a question on paper, fold it, and pass it to a neighbouring group. The receiving group reviews the response and adds any questions or comments they have.
- (15) **Exit Ticket:** Employed at the end of a class session, this technique assesses student learning. Students answer predetermined questions on a card and submit it to the teacher before leaving.

To enhance the integration of active learning techniques among teachers, school administrators can employ professional development sessions (Alkaabi, 2023; Alkaabi et al., 2023; Alkaabi, 2021). These sessions should be complemented by follow-up practices designed to assess the effective implementation of these techniques by teachers (Alkaabi & Almaamari, 2020; Almaktoum & Alkaabi, 2024).

Subsequently, administrators can collect data to offer constructive feedback (Badawy & Alkaabi, 2023) to support continuous improvement in the execution of active learning strategies.

## CONCLUSION

Active learning is highly regarded as a best practice in education and has earned broad endorsement from both educators and students. Despite the challenges it poses, including the need for comprehensive planning and active engagement from instructors, the benefits of implementing active learning strategies are substantial. These strategies not only involve students more closely with the content but also cultivate deeper understanding and reflective learning experiences. With a wide range of active learning methods available, their application is versatile across different educational contexts, including virtual and in-person settings. Techniques like think-pair-share in large lecture courses demonstrate active learning's adaptability. Starting with simpler methods and gradually advancing to more complex ones can greatly assist instructors who are new to this approach. In addition, investing in active learning signifies a commitment to enriching the depth and quality of student learning experiences.

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## Active Learning

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# Chapter 4

## Fostering Students’ Critical Thinking Through the Implementation of Project–Based Learning

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### **ABSTRACT**

*This chapter examines the role of project-based learning (PBL) in fostering students’ critical thinking skills. By providing both theoretical foundations and practical insights, the chapter explores how PBL can create meaningful connections and enhance students’ preparedness for the future. The authors emphasize key strategies employed in PBL, including active and differentiated learning, collaborative group work, critical thinking skills, and research and investigation. These strategies empower students to tackle real-world problems and challenges, enabling them to develop their critical thinking abilities. Throughout the chapter, the authors highlight the importance of PBL as an approach that promotes deeper learning and equips students with the skills needed to navigate the complexities of the world around them.*

### **INTRODUCTION**

In order to provide students with engaging and memorable learning experiences, educators have adopted various teaching methodologies that involve assigning tasks and conducting activities. These approaches aim to offer students different approaches to acquiring knowledge and diverse experiences throughout the learning process. One teaching method that has gained popularity is Project-Based Learning (PBL), as highlighted by Munawaroh (2017). PBL is a learning method that involves students engaging in

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## ***Fostering Students' Critical Thinking Through Project-Based Learning***

real-world, hands-on projects, enabling them to apply their knowledge, ideas, and skills throughout the project completion process (Buck Institute for Education, 2019).

According to Evans (2019), PBL immerses both students and teachers in genuine situations, addressing authentic issues and practical arrangements. This approach eliminates the barriers that might otherwise exist between classroom practice and real-world application. Furthermore, as students work on projects for varying durations, they apply their previously acquired theoretical knowledge effectively. Consequently, when students are assigned to engage in Project-Based Learning, it enhances their comprehension of the concepts taught in the classroom and allows for a visual representation of their learning journey during the project's completion (Irembere, 2019).

Moreover, Project-Based Learning contributes to the development of students' knowledge, communication skills, creative and critical thinking, teamwork, and more. This multifaceted approach exposes students to authentic materials, real-life challenges, complex problem-solving, and solutions, enabling them to tackle every aspect encountered throughout the PBL sessions with their teachers. Essentially, PBL serves as an extensive teaching and learning method designed to guide students through the intricacies of critical analysis, material challenges, and the effective composition of assignments (Chen, 2019). In this chapter, we will discuss the benefits of PBL for fostering critical thinking skills in students, as well as specific strategies that teachers can use to implement PBL in their classrooms.

## **BACKGROUND**

### **Basic Characteristics of Project-Based Learning**

The effectiveness of teaching methods has been studied by researchers around the globe, such as Iwamoto, Hargis, and Voung (2016) and Irembere (2019). According to these studies, PBL is one teaching method that benefits students' performance in the classroom. PBL promotes learner-centeredness, active learning techniques, and encourages meaningful tasks that lead to problem-solving, critical thinking, and decision making (Chen, 2019). As highlighted by Cabral and Nobre (2015), many schoolteachers report a preference for focusing on the final product and often assign homework to students because they believe that carrying out such tasks in the classroom is time-consuming (Abdallah & Farhan, 2023).

Different key characteristics of PBL activities have been identified by educational researchers, who have shared their diverse opinions on the subject. For instance, Stoller (2002) and Giri (2016) highlight the following features of PBL:

- PBL focuses on real-world subject matter, which captures students' interest and relevance to their lives.
- PBL is a learner-centered teaching method, where the teacher assumes the role of a guide and facilitator to support students throughout the process.
- Collaborative skills are developed through PBL, as students work in small groups, sharing ideas, and collaborating on tasks. Simultaneously, students also have opportunities to work independently and foster their own sense of autonomy.
- PBL activities are designed around the integration of real-life tasks, providing students with authentic learning experiences.



- The emphasis in PBL is not solely on the final product but also on the process of working towards the completion of the project. This process is valued for its developmental aspects.
- PBL is known for its motivational and engaging nature. The outcomes of project work are not only rewarding but also contribute to improving students' self-esteem. Additionally, PBL helps students develop language skills, critical thinking abilities, and collaboration skills, as mentioned earlier.

## **Benefits of Project Based Learning**

Teaching and learning are not static but dynamic processes. There is no single absolute method for teaching and learning, as we continually review and experiment with evidence from various research-based interventions and studies. Project-Based Learning, also known as PBL, is a teaching method where students acquire knowledge and skills over a period of time, following specific criteria (Buck Institute for Education, 2019). According to the institute, these criteria should involve authentic, engaging, and complex questions, problems, or challenges (Abdallah & Abdallah, 2023).

PBL is recognized as a superior approach to learning compared to the standard “lecture” style because it enables students to better understand the curriculum and its content (Barron et al., 1998; Baumgartner & Zabin, 2008; Beneke & Ostrosky, 2008). Consequently, PBL is a more effective method for acquiring knowledge and developing skills (Mahsan & Ibrahim, 2017). As a result, students have greater opportunities to demonstrate their understanding of the subject matter compared to traditional peer learning methods.

There is a visible consensus on the benefits of PBL in enhancing a wide range of skills (Harmer & Stokes, 2014). These skills, provided by PBL and other student-centered approaches, include independent and critical thinking, which are crucial for promoting deeper learning in students' future careers and civic life (Condliffe et al., 2017). The ability to adapt to changes can be considered one of the most important skills in today's world. Teachers need to bear in mind the ever-changing needs of students and adopt a forward-thinking approach.

Based on numerous studies that focus on the effectiveness of PBL in increasing the level of understanding in teaching and learning among students, the Buck Institute for Education has introduced the Gold Standard PBL. This framework comprises Seven Essential Project Design Elements and Seven Project-Based Teaching Practices (Darawsheh et al,2023).

Larmer and Mergendoller (2010) conceptualized PBL and identified seven essential elements of this approach: Larmer and Mergendoller (2010) conceptualized Project-Based Learning (PBL) and identified seven essential elements of this approach: a) the need to know, b) a driving question, c) student voice and choice, d) 21st Century Skills, e) inquiry and innovation, f) feedback and revision, and g) a publicly presented product.

## **Project-Based Learning and Critical Thinking**

The 21st-century learners are dynamic and well-informed, with easy access to vast resources regardless of their location or time. Consequently, in an ever-changing and dynamic world, educators need to reconsider their teaching and learning strategies, as well as the competences they aim to enhance in the classroom. In this context, learners should be equipped with skills that enable them to tackle the challenges of the modern era (Abdallah et al,2023). Therefore, it is essential to incorporate modern teaching approaches that foster skills such as collaboration, creativity and innovation, critical thinking, communication, problem-solving, and ICT skills (Giri, 2016).

## ***Fostering Students' Critical Thinking Through Project-Based Learning***

Despite this, some teachers still adhere to traditional methods and neglect the integration of these important skills. The focus of learning and innovation should be on fostering creativity through collaboration and effective communication with others. Additionally, it should emphasize critical thinking, effective reasoning, and problem-solving.

Though it goes without saying that education must be transformed to allow for new learning approaches that address the challenges students will face in work and life, there is no set of rules that educators can follow to train students for the 21st century. However, as suggested by Scott (2015, p. 2), “there are a number of effective, research-based curriculum models capable of guiding 21st Century learning.” These models differ from textbook-based, teacher-centered approaches, which have been found ineffective in developing students’ 21st Century Skills (Giri, 2016).

However, teaching has witnessed several traditional learning methods and approaches over the years. Since the 20th century, there has been a significant shift towards implementing learner-centered methods such as Communicative Teaching (CT), Task-based Learning (TBL), Inquiry-based Learning, Content, and critical thinking (CT), and PBL. Each of these methods, when used in classrooms, incorporates principles aimed at enhancing students’ 21st Century Skills. Therefore, teachers should embrace these innovative methods and approaches to ensure that students acquire the necessary skills to succeed in life (Chen, 2019).

Furthermore, critical thinking is frequently cited as one of the most important 21st-century skills, and it lies at the heart of PBL, as project work is often carried out in groups. According to Bell (2010), while working on projects, students actively seek new ideas and attempt to develop solutions or plans. In this process, they engage in brainstorming and learn to be receptive to different perspectives.

According to Bell (2010, p. 42), in PBL, students learn through collaboration and apply critical thinking skills as they engage in projects. Tsiplakides and Fragoulis (2009) highlight the significance of critical thinking as a lifelong and transferable skill that extends beyond the school environment. The process of gathering and analyzing information during project work further enhances students’ critical thinking abilities (Yimwilai, 2020). Additionally, there appears to be a correlation between critical thinking and problem-solving skills. Dewi (2016, p. 348) emphasizes that participating in independent work and collaboration allows learners to improve their problem-solving skills and develop their critical thinking abilities. Tsiplakides and Fragoulis (2009, p. 114) share a similar perspective, stating that PBL activities are designed to cultivate students’ thinking and problem-solving skills. Throughout the projects, students comprehend the problem, devise a plan with strategies for solving it, carefully consider the strategies before implementation, and ultimately execute their action plan (Moursund, 1999).

Another recognized 21st-century skill is creativity, and the significance of PBL in fostering creativity has been underscored by Irembere (2019). According to Yimwilai (2020), PBL plays a crucial role in enhancing students’ creativity and creative thinking. This is attributed to the increased responsibility students have in the project development process, while teachers facilitate their progress towards achieving the set goals. As suggested by Irembere (2019), teachers should demonstrate creativity, teach in a creative manner, and provide opportunities to encourage students’ creativity.

Furthermore, PBL supports the development of research and ICT skills. Once students choose a topic and establish their goals, they engage in gathering information through research. This research can be conducted using various sources of information, including the internet. Dewi (2016, p. 348) asserts that “by locating resources themselves, learners’ research skills develop and improve.” It is crucial to note that obtaining information from the internet is significant as it contributes to ICT literacy, which is one of the essential 21st Century Skills. However, Bell (2010) warns that teachers must exercise caution

regarding the reliability and safety of the sources. Therefore, teachers should provide scaffolding and guidance to ensure that students can explore safely and effectively.

## **Critical Thinking**

Critical thinking encompasses the ability to interpret data, make assumptions, present points effectively, analyze information, and evaluate evidence. It is a skill that continues to develop among students (Anazifa et al., 2017). Often referred to as higher-level thinking, critical thinking encompasses the top three competencies in Bloom's Taxonomy: analyzing, synthesizing, and evaluating (Stanley & Moore, 2013). Open-ended or divergent questions play a crucial role in developing critical thinking skills. These types of questions have multiple correct answers, encouraging students to think critically about various possibilities. Problem-based learning, particularly in the field of science, is a teaching method that promotes critical thinking skills. It presents students with real-world problems that require them to not only identify the underlying reasons but also develop methods to address them (Strobel & Barnevel, 2009). Problem- and project-based learning contribute to enhancing and refining students' critical thinking abilities (Anazifa et al., 2017).

The development of creativity aims to equip students with the ability to tackle challenges individually or within groups (Kind & Kind, 2007). According to Trilling and Fadel (2009), creativity flourishes in an environment that encourages questioning, persistence, exploration of innovative ideas, trust, and learning from failures and mistakes. Regular practice can help enhance students' creativity. Learning through projects that involve solving real-world problems is one of the most effective methods for fostering creativity. Additionally, creative thinking significantly impacts students' academic achievement, alongside problem- and project-based learning (Anazifa et al., 2017).

## **Fostering Critical Thinking Skills Through PBL**

Project-based learning is a powerful instructional approach that effectively fosters critical thinking skills among students. By engaging in real-world problem-solving, critical analysis, and creative thinking, PBL provides students with opportunities to apply their knowledge and develop higher-order cognitive abilities (Sasson et al., 2018). In PBL, students immerse themselves in authentic, complex problems that require critical thinking to solve. They analyze the problem, evaluate potential solutions, and make informed decisions based on evidence and reasoning. PBL projects also encourage inquiry and research, prompting students to ask questions, conduct investigations, and synthesize information from various sources (Zessoules & Gardner, 1991).

PBL projects require students to analyze and evaluate information from diverse sources. They learn to discern reliable information, identify bias, and critically evaluate the credibility and validity of sources. Students develop skills in distinguishing between relevant and irrelevant information, enabling them to make informed decisions and construct well-supported arguments (Anazifa et al., 2017). Creativity and innovation are nurtured in PBL as students are encouraged to think outside the box and generate original ideas. They explore multiple perspectives, consider alternative solutions, and approach problems from different angles. PBL projects often incorporate open-ended questions and scenarios that challenge students to think critically and creatively (Stanley & Moore, 2013).

Collaboration and communication play vital roles in PBL. Students engage in group discussions, debates, and presentations, articulating their thoughts, listening to others' perspectives, and engaging in

## ***Fostering Students' Critical Thinking Through Project-Based Learning***

constructive dialogue. Collaborative problem-solving enhances critical thinking by exposing students to diverse viewpoints and challenging them to consider alternative solutions (Abdallah & Alkaabi, 2023). PBL emphasizes reflection and metacognition throughout the project. Students are encouraged to reflect on their thinking processes, evaluate their progress, and identify areas for improvement. Through metacognitive practices, students become more self-aware, monitor their own thinking, and develop the ability to recognize and correct biases or faulty reasoning (Al-Rashaida et al., 2022).

### **Challenges Faced by Teachers in Implementing Project-Based Learning**

Despite the numerous benefits of project-based teaching methods, educators have encountered resistance in adopting them due to various challenges. One major obstacle is the lack of clarity regarding how to plan, guide, and assess project-based learning, particularly for novice teachers (Clark, 2006). Additionally, some teachers may lack the necessary training and resources to effectively implement project-based learning. For example, in Estonia, the Tiger Leap Foundation (TLF) was established to support teachers in strategy, planning, and practical aspects related to project-based learning. The TLF provided training sessions to enhance teachers' understanding and implementation of project-based learning (Weatherby, 2007). Similarly, in Hong Kong, the government offered free downloads of project-based learning resources to teachers, aiming to supplement their existing curriculum and facilitate the accessibility of project-based learning (Weatherby, 2007).

Project-based learning is a powerful instructional approach that fosters critical thinking and problem-solving skills among students. However, its successful implementation requires teachers to navigate various obstacles.

One of the biggest challenges is limited experience and training in PBL. Many educators may be unfamiliar with the pedagogical principles and instructional strategies that underpin effective PBL implementation (Aksela & Haatainen, 2019). To address this challenge, it is vital to provide teachers with professional development opportunities, workshops, and resources that equip them with the necessary knowledge and skills to design and facilitate PBL projects successfully (Navy et al., 2020).

Another challenge is time constraints. Developing meaningful projects that align with curriculum standards and provide ample opportunities for student engagement requires dedicated planning and preparation (Chen et al., 2020). To overcome this challenge, schools and districts should allocate dedicated time for teachers to collaborate, plan, and design PBL projects. Additionally, leveraging technology and online resources can streamline the project development process and save time.

Assessment and evaluation in PBL settings is another challenge that teachers encounter. Traditional assessment methods may not adequately capture the multifaceted nature of PBL, which emphasizes critical thinking, collaboration, and problem-solving skills (Pan et al., 2020). To address this challenge, teachers must develop authentic and formative assessment strategies that align with project goals and encourage student reflection. These strategies may include rubrics, portfolios, presentations, and self-assessment tools, allowing for a comprehensive evaluation of student learning (Sukackè et al., 2022).

Resource constraints can also impede the implementation of PBL. Teachers require access to materials, technology, and community resources to create authentic and engaging projects (Wondie et al., 2020). To address this challenge, schools and districts should provide support to ensure teachers have the necessary resources to implement PBL effectively. Collaborating with local businesses, experts, and community organizations can also enrich the project experience and address resource limitations.

Transitioning to a student-centered and collaborative PBL environment requires adjustments to classroom management strategies (Manske, 2021). To address this challenge, establishing clear expectations, protocols, and procedures is crucial to guide student interactions and ensure productive teamwork. Strategies such as establishing roles and responsibilities within groups, fostering effective communication, and providing scaffolding for self-regulation can help teachers overcome classroom management challenges (Henderson et al., 2022).

In addition to classroom management, aligning PBL projects with existing curriculum frameworks and learning objectives can be challenging (Harris, 2014). Teachers must carefully design projects that integrate subject-specific content and skills while addressing broader learning goals. Close collaboration with colleagues and subject-area experts can help ensure alignment and guarantee that PBL projects enhance rather than detract from the curriculum (Henderson et al., 2022).

Finally, overcoming resistance to change from stakeholders, such as administrators, parents, and students, is another common challenge in implementing PBL (Harris, 2014). Effective communication is key to addressing concerns and misconceptions while sharing research-backed evidence of the benefits of PBL. Providing opportunities for stakeholders to observe PBL in action, engaging them in the planning process, and showcasing student achievements can help overcome resistance and build support for PBL (Aldabbus, 2018). By addressing these challenges, teachers can create a PBL environment that fosters critical thinking, problem-solving, and collaboration skills in students.

### **Strategies to Address the Challenges Teachers Face in Implementing Project-Based Learning**

To mitigate the challenge of limited experience and training, it is imperative to provide teachers with professional development opportunities, workshops, and resources that equip them with the requisite knowledge and skills to design and facilitate PBL projects successfully (Navy et al., 2020). Simultaneously, overcoming the challenge of time constraints necessitates schools and districts to allocate dedicated time for teachers to collaborate, plan, and design PBL projects. Moreover, leveraging technology and online resources can streamline the project development process and save valuable time (Chen et al., 2020). Furthermore, addressing the challenge of assessment and evaluation within PBL settings entails that teachers must develop authentic and formative assessment strategies that align with project goals and encourage student reflection. These strategies may encompass the use of rubrics, portfolios, presentations, and self-assessment tools, allowing for a comprehensive evaluation of student learning (Sukacké et al., 2022).

In addition, to tackle the challenge of resource constraints, schools and districts should proactively provide support to ensure teachers have the necessary resources to implement PBL effectively. Collaborating with local businesses, experts, and community organizations can enrich the project experience and effectively address resource limitations (Henderson et al., 2022). Equally significant is addressing the challenge of classroom management strategies. This involves establishing clear expectations, protocols, and procedures to guide student interactions and ensure productive teamwork. Strategies like defining roles and responsibilities within groups, fostering effective communication, and providing scaffolding for self-regulation can significantly assist teachers in overcoming classroom management challenges (Henderson et al., 2022).

Moreover, addressing the challenge of curriculum alignment necessitates that teacher meticulously design projects that seamlessly integrate subject-specific content and skills while concurrently address-

## ***Fostering Students' Critical Thinking Through Project-Based Learning***

ing broader learning objectives. Close collaboration with colleagues and subject-area experts is pivotal to ensure alignment and guarantee that PBL projects enhance, rather than detract from, the established curriculum (Henderson et al., 2022). Lastly, conquering the challenge of resistance to change hinges on effective communication. This involves addressing concerns and misconceptions while simultaneously sharing research-backed evidence showcasing the benefits of PBL. Providing opportunities for stakeholders to observe PBL in action, involving them in the planning process, and showcasing student achievements can collectively help overcome resistance and build robust support for PBL (Aldabbus, 2018). In summary, the implementation of Project-Based Learning presents an array of challenges for teachers. By acknowledging these challenges and employing the appropriate strategies, educators can effectively navigate these obstacles and create engaging and meaningful learning experiences for their students (Abdallah et al,2023).

### **Future Research Directions**

Research can investigate the most effective approaches for training teachers in PBL methodologies, both during their pre-service education and through ongoing professional development programs. Studies can also examine the impact of PBL training on teacher practice and student outcomes over the long term. Assessment and evaluation: Research can focus on developing and validating assessment and evaluation tools specifically tailored for PBL. Studies can also explore how to effectively integrate formative assessment practices within the PBL process to enhance student learning.

### **CONCLUSION**

Project-based learning is a powerful instructional approach that fosters critical thinking skills in students. By engaging in real-world projects, students are able to apply their knowledge and skills to solve authentic problems, develop important skills such as communication, collaboration, and creativity, and learn to think critically, analyze information, and make informed decisions. Through the integration of PBL in the classroom, educators can cultivate students' ability to think critically, equipping them with essential skills for success in the modern world.

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## ***Fostering Students' Critical Thinking Through Project-Based Learning***

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## **KEY TERMS AND DEFINITIONS**

**Authentic Assessment:** An evaluation method that measures students' abilities to apply their knowledge and skills in meaningful, real-world contexts. It goes beyond traditional tests and exams, focusing on performance-based tasks, portfolios, and demonstrations of understanding, providing a more comprehensive picture of students' critical thinking abilities.

**Critical Thinking:** The ability to analyze, evaluate, and interpret information in a thoughtful and logical manner. It involves questioning assumptions, considering multiple perspectives, and making reasoned judgments, enabling individuals to solve complex problems and make informed decisions.

**Inquiry-Based Learning:** An approach to learning that encourages students to ask questions, investigate, and explore topics of interest. It promotes active engagement, curiosity, and critical thinking as students seek answers, gather evidence, and draw conclusions through their own inquiry process.

**Project-Based Learning (PBL):** An instructional approach where students engage in authentic, real-world projects to apply their knowledge and skills. PBL emphasizes active learning, problem-solving, and collaboration, fostering critical thinking and creativity.

## Chapter 5

# Empowering All Students: Revolutionizing Education with Gamification, Project-Based Learning, and Inclusive Support

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### ABSTRACT

*This chapter focuses on innovative teaching strategies for students of determination in UAE. Gamification, project-based learning, and innovative use of technology in special education promise to revolutionize how we educate and support students with special needs in the schools today providing new opportunities for these students. Education nowadays is moving away from rote learning towards dynamic, interactive, and enjoyable educational experiences. Interactive educational approaches have gained considerable momentum not only in mainstream education but also as an important tool in special education. By infusing fun and engagement into learning, teachers have the potential to unlock the talents of students with special educational needs or the gifted and talented. It is the collective responsibility of educators of the future to ensure an inclusive and supportive educational environment for all students, meeting their needs, and supporting them to reach their potential regardless of their abilities or challenges.*

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## **INTRODUCTION**

This chapter explores the transformative potential of gamification, project-based learning, and technology in revolutionizing education and providing inclusive support for students with determination. The aim is to highlight how these innovative approaches can create engaging and empowering learning experiences for all students, regardless of their abilities or challenges.

First, the authors delve into the concept of gamification and its application in educational settings. This part of the chapter embarks on an exploration of the profound impact of gamification on education, with a specific emphasis on its ability to cater to the unique requirements of students facing diverse challenges. We delve into the fundamental principles of gamification, touching on its benefits for students with special needs or determination, and discuss the tools, technologies, and best practices for its successful implementation.

Next, the chapter explores the power of project-based learning as a pedagogical approach that nurtures critical thinking, collaboration, and problem-solving skills. The authors discuss how project-based learning can be tailored to accommodate the diverse needs of students with determination, enabling them to actively engage in meaningful projects that align with their interests and strengths.

Additionally, the chapter examines the pivotal role of technology in enhancing educational experiences for all students through gamification and project-based learning. By harnessing the potential of technology, the aim is to create inclusive learning environments where students with determination can thrive and reach their full potential.

Throughout the chapter, the authors emphasize the importance of addressing the unique concerns and challenges faced by students with determination. This chapter highlights strategies for inclusive instructional design, teacher training, and collaboration between educators, parents, and support professionals.

By the end of this chapter, readers will gain a comprehensive understanding of how gamification, project-based learning, and the use of technology can be harnessed to create inclusive, engaging, and empowering educational experiences that meet the needs of all students, including those with determination. The authors provide practical insights and recommendations to guide educators and policymakers in implementing these approaches effectively and inclusively, fostering a future of education that leaves no student behind.

## **REVOLUTIONIZING SPECIAL EDUCATION WITH GAMIFICATION**

### **Gamification in an Inclusive Learning Environment**

Education, a potent force for empowerment and personal growth, frequently presents formidable obstacles to students with special needs or determination (Corbett & Barton, 2018). The rigid structure and standardized curricula of conventional classrooms often hinder rather than nurture these individuals (Sawyer, 2011). To address this challenge and create more inclusive and engaging learning environments, educators have embraced an innovative strategy known as gamification (Alejandro & David, 2018). Gamification in education represents a significant departure from conventional teaching methods (Kapp, 2012). It shifts the focus away from rote learning and towards dynamic, interactive, and enjoyable educational experiences (Licorish et al., 2018). This approach has gained considerable momentum not only in mainstream education but also as an important tool in special education (Khaitova, 2021).

By infusing fun and engagement into learning, gamification holds the potential to unlock the talents of students with special needs or determination, equipping them with essential skills for navigating an ever-evolving world (Swargiary & Roy, 2023).

Gamification, an innovative educational strategy, incorporates principles from game design into non-game settings, notably educational contexts (Dichev & Dicheva, 2017). The primary objective of gamification is to enhance educational experiences by leveraging individuals' innate desires for achievement, competition, and rewards (Chou, 2019). This distinguishes it from traditional teaching methods, which often rely on lectures, textbooks, and standardized assessments (Lee et al., 2016), offering a more interactive and dynamic approach to learning (Nieto-Escamez & Roldán-Tapia, 2021).

To gain a deeper understanding of gamification, it is essential to implement its fundamental components. Gamification transforms the learning experience by incorporating gaming elements such as points, badges, leaderboards, quests and challenges, progression, and levels, creating a more interactive and engaging educational environment (Zichermann & Cunningham, 2011). Its capacity to tap into intrinsic motivators like achievement and competition (Qiao et al., 2022) positions it as a potent tool for enhancing education, particularly benefiting students with special needs or determination.

## **Gamification Supporting Students With Special Needs**

Gamified learning environments offer numerous advantages for special needs students. One of the most significant distinctions between gamification and traditional teaching approaches lies in their capacity to engage and motivate students (Kim & Lee, 2015). Gamification leverages competition and achievement as motivators, encouraging individuals to excel, including special needs students who may struggle with motivation in traditional settings (Burke, 2016). Conventional classrooms often struggle to maintain students' interest and enthusiasm, particularly those with special needs. Gamification addresses this challenge by introducing elements such as challenges, competition, and rewards, inherently making the learning process more engaging and motivating (Kiryakova et al., 2014). Additionally, it promotes active learning, transforming students into active participants rather than passive recipients of information (Brull & Finlayson, 2016). This stands in contrast to traditional teaching methods, which often rely on passive listening and rote memorization. Moreover, gamification allows for a higher degree of personalization, adapting to individual learning preferences, strengths, and weaknesses; gamification tools prioritize accessibility, accommodating various needs, which can be particularly advantageous for students with special needs (Rodrigues et al., 2022). It allows tailored activities that accommodate each student's specific needs and learning styles, ensuring they receive the necessary support and challenges (Benton et al., 2014). Additionally, students receive instant feedback, fostering self-assessment and a sense of accomplishment (Rahayu & Purnawarman, 2019). They reduce anxiety, creating a non-judgmental space for experimentation and learning (Sajjad, 2017). Collaborative elements improve social skills, while sustained engagement and progression foster independence and self-confidence (Papanastasiou et al., 2017). In essence, gamification empowers special needs students, providing a supportive and accessible platform to conquer educational challenges and achieve their full potential (Jandigulov et al., 2023).

## **Challenges of Gamification in Special Education**

Although gamification in special education offers significant advantages but also comes with various challenges. Challenges in implementing gamification techniques for students with special needs include

## ***Empowering All Students***

time constraints, workload, teacher training, teacher perceptions and attitudes, and the availability of resources and support (Karunamoorthy & Tahar, 2020). Accessibility is a major hurdle, with many gamification tools lacking consideration for special needs students (Smith & Abrams, 2019). Additionally, heavy reliance on technology can exacerbate the digital divide (Chan et al., 2022). Moreover, customization can be daunting for educators besides other challenges (Xiao & Hew, 2023). Addressing these challenges necessitates collaboration among educators, administrators, developers, and policymakers to create an inclusive and effective gamified learning environment that meets the diverse needs of all students, including those with special needs (Ismail et al,2023).

## **Gamification Tools, Technologies, and Practices in Special Education**

Technology-enhanced learning has ushered in a new era of opportunities for education, including special education (Rose & Meyer, 2002). The rapid advancements in educational technology offer innovative tools and resources that can be tailored to meet the unique needs of students with special needs or determination (Bates & Sangra, 2011). These technologies provide a platform for personalized learning experiences, allowing educators to adapt content and teaching methods to individual learning styles (Grant & Basye, 2014). Assistive technologies, adaptive software, and augmented reality applications can transform abstract concepts into tangible and accessible experiences (Bouck & Yadav, 2022; Yenioglu et al., 2021). Moreover, technology bridges geographical barriers, enabling students to access specialized resources and expertise beyond the confines of traditional classrooms (Dede, 1996). As technology continues to evolve, it holds the potential to revolutionize special education, making learning more inclusive, engaging, and empowering for every student (Grant & Basye, 2014).

Gamification has emerged as a powerful tool in special education, revolutionizing the way students with diverse needs engage with learning (Hussein et al., 2023). Through the integration of various tools and technologies, educators can create engaging and effective gamified learning experiences tailored to the specific requirements of their students (Kiryakova et al., 2014, October). Gamification in special education encompasses various innovative approaches, including educational games, apps, and platforms. Educational games, as a direct application, blend learning with engaging gameplay to facilitate interactive knowledge acquisition (Chaidi & Drigas, 2022). These games cover a wide range of subjects and cater to diverse disabilities, providing solutions for mathematics (Bakker et al., 2016), language (Charlton et al., 2005), and social interaction (Hussein et al., 2023). Gamified apps leverage mobile technology for personalized learning, adapting to individual levels and supporting communication development (Fernández-López et al., 2013). Learning Management Systems (LMS) incorporate gamification tools, allowing educators to design tailored courses for students with disabilities, aligning with individualized education plans (IEPs) (Sitra et al., 2017). Augmented Reality (AR) and Virtual Reality (VR) immerse students in interactive environments, aiding those with mobility or sensory challenges (Frasson, 2021). Accessible game controllers ensure inclusivity, while customizable learning platforms empower educators to adapt gamified content to meet unique student needs, effectively revolutionizing special education (Ali, 2023).

Overall, gamification tools and technologies have revolutionized special education, making learning more engaging, interactive, and accessible for students with diverse needs. Educational games, gamified apps, learning management systems, augmented and virtual reality, accessible game controllers, and customizable learning platforms offer a wealth of options for educators to create customized and inclusive gamified learning experiences. As technology continues to advance, the potential for gamification to empower special education students to reach their full potential remains boundless (Darawsheh et al,2023).

Implementing gamification in special education necessitates careful consideration of best practices. Firstly, it is crucial to align gamified activities with individualized education plans (IEPs) to cater to specific student needs and goals (Akperov et al., 2022). Secondly, educators should select gamification tools and platforms that offer accessibility features, ensuring inclusivity for all students, regardless of disabilities (Santórum et al., 2023; Haleem et al., 2022). Additionally, maintaining a balance between fun and learning is key; gamification should enhance engagement without compromising educational objectives (Manzano-León et al., 2021). Regular assessments and data tracking can help tailor gamified content to each student's progress and needs (Rodrigues et al., 2021). Lastly, continuous professional development for educators ensures they are well-equipped to effectively integrate gamification techniques into their teaching methods, promoting a more inclusive and engaging special education experience (Manzano-León et al., 2022).

## **Conclusion**

In conclusion, the future of gamification in special education promises to revolutionize how we educate and support students with special needs or determination. Technology advancements, a commitment to inclusivity, and personalized learning will shape this future, providing new opportunities for these students. It is our collective responsibility to ensure gamification creates an inclusive and supportive educational environment for all students, regardless of their abilities or challenges.

## **PROJECT-BASED LEARNING: FOSTERING CRITICAL THINKING AND COLLABORATION**

### **Project-Based Learning in an Inclusive Learning Environment**

Project-based teaching and learning have become increasingly prominent as support to challenges schools face for students with different abilities in the 21<sup>st</sup> Century (Filippatou & Kaldi, 2010). Project-based learning is simply an educational approach, that is a student-centered model that organizes learning around projects to actively engage in the real world (e.g., hands-on projects that engage students to collaborate and problem-solve) (Du & Han, 2016). According to Mkrтчian (2018), project-based learning actively involves learners in investigating real-world issues and answering related questions. Moreover, the active project-based learning process considers students' various learning styles and preferences (Bell, 2010). As an instructional method, project-based learning has been proven to support students with intellectual disabilities in an inclusive environment (Mkrтчian, 2018). Furthermore, a study conducted by Kee and Lai (2022) found that project-based learning can contribute to inclusive education and empower the socioeconomically disadvantaged community in the process. Kee and Lai (2022), also stated that despite facing challenges in conducting community engagement due to the COVID-19 pandemic, including closures of community centers and the need for social distancing, the project-based learning format can be extended to other inclusive education initiatives. Project-based learning serves to integrate design theory and practice, enabling students to develop a heightened awareness of inclusivity and drive social innovation (Kee & Lai, 2022). Project-based learning purposefully tackles challenges of diversity and equity in both curricular content and classroom methodologies, which would hold significant potential for students with disabilities (Boardman & Hovland, 2022).

## **Project-Based Learning Supporting Students With Special Needs**

It is crucial that students who have special requirements are educated in a way that equips them to tackle learning obstacles using critical thinking abilities (Eldiva & Azizah, 2019). Sriram (2018), stated that project-based learning allows special education teachers to enhance student motivation and social interaction, align with individualized education plans (IEPs), integrate cross-curricular concepts into a single project, and initiate IEP transition services to better equip students for life beyond school. Instilling critical thinking skills in students with special needs can facilitate their comprehension of differing viewpoints and enable them to make choices; this proficiency, with consistent practice, can eventually empower them to lead independent lives within society (Suryani & Dewiana, 2016). As a result, the approach of project-based learning necessitates that students actively engage in addressing challenges through tasks, fostering research, and employing effective strategies for critical thinking either individually or in cooperation with peers (Eldiva & Azizah, 2019; Abdallah & Alkaabi, 2023). When educators offer innovative learning prospects that encourage students to construct knowledge actively, their students develop creativity and higher-order thinking (Amponsah et al., 2019). Project-based learning is seen as an effective approach when working with diverse and exceptional students. However, although teachers may be familiar with project-based learning as an instructional strategy, practitioners might have a limited grasp of the methodology involved in project-based learning (Hovey et al., 2014). In a study conducted by Purnomo et al. (2022), they found that project-based learning at inclusive primary schools during the COVID-19 pandemic effectively helped students with special needs to be active, participatory, and motivated to solve learning problems.

## **Project-Based Learning Challenges**

The implementation of PBL is frequently met with challenges. According to Condliffe (2017), project-based learning requires a shift in the role of teachers, transitioning from being directors to becoming facilitators of learning. This shift also requires a willingness to embrace not only ambiguity but also increased levels of activity and movement within the classroom. Condliffe (2017) also states that teachers must acquire new classroom management techniques and understand how to effectively support their students in their learning endeavors, and incorporate technology as needed. Above all, they must have faith in their students' capability to excel through this approach (Condliffe, 2017). Moreover, Habók & Nagy (2016) argue, that thoughtful planning is necessary for the success of project-based learning, which can potentially feel like a burden to educators. Habók & Nagy (2016) also state that the planning and implementation of a project is notably time-consuming and requires great attention to detail from the learners. In a study conducted by Campbell (2012), challenging themes that emerged in the study were device distractions, missing directions, attendance, wasted time, class size, vocabulary instruction, follow-through, differentiation, percentage of ELL and special needs students, and student confidence and ability to continue their project (Ismail et al,2023; Ramadan, & Ismail2023).

## **Project-Based Learning and the Use of Technology**

According to research conducted by Eskrootchi and Oskrochi (2010), it is proposed that students achieve optimal learning outcomes when they actively build knowledge through a blend of firsthand experiences, interpretation, and well-organized interactions with both peers and instructors, espe-



cially when technology is incorporated into the process. Beckett and Slater (2018), also mention that the use of technology in project-based teaching and learning can cultivate decision-making abilities, promote self-reliance, and bolster collaborative work skills. It also stimulates students' creativity, nurtures their capacity for creative thinking, and refines their problem-solving capabilities (Beckett & Slater, 2018). Furthermore, students tend to find project-based learning enjoyable when centered around technology. However, Bell (2010) argues that while students demonstrate remarkably advanced computer skills, it's crucial to remember that they are still young and require proper guidance to utilize technology safely and efficiently, thus unlocking the creative potential that technological engagement can provide. Furthermore, the utilization of technology during the COVID-19 pandemic demonstrated its effectiveness in facilitating project-based learning. In a study conducted by Hira and Anderson (2021), they found that to effectively conduct project-based teaching and learning online, it's crucial that activities and projects align with students' interests and cultivate skills that they can independently excel in. They also stated that students should be motivated to assume responsibility for their own learning, and activities should facilitate interactions between peers and mentors, even in virtual environments (Hira & Anderson 2021). Ultimately, technology should serve as a tool, and not the goal, allowing students to explore various technological resources throughout all facets of project-based learning. When technology is integrated authentically, it captivates students' interest, capitalizing on their proficiency with devices (Bell, 2010). Moreover, incorporating technology into project-based learning can provide learning support in an inclusive classroom, especially for students with specific learning disabilities as well as sensory-impaired disorders (Obradovic et al., 2015).

## **Conclusion**

In recent times, the demands of the 21st century, encompassing both knowledge and skills, have reshaped the requirements and functions of both learners and educators. Currently, Project-Based Learning represents an innovative teaching approach that mirrors real-life scenarios for students. It caters to the learners' requirement for chances to apply their knowledge and skills, enabling them to expand their understanding and enhance their proficiency through hands-on activities (Habók & Nagy, 2016; Abdallah & Alkhrabsheh, 2019). Children with learning difficulties can engage in learning experiences through project-based learning at their own level to meet their social and academic goals. Habók & Nagy (2016), also state that the use of modern technology is essential for ELL and special needs students to increase independence, simplify communication with teachers and peers, and make learning more personalized. Additionally, students with special needs participating in project-based learning benefit from prior instruction on cooperative work. This preparation helps them grasp the significance of working together as a group and reinforces the importance of aiding and supporting one another's learning. (Filippatou & Kaldi, 2010). Moreover, it is important to understand that projects require a considerable amount of preparation and planning from teachers and learners (Campbell, 2012). In all, incorporating project-based learning into inclusive education not only promotes active engagement and personalized learning experiences for all students but also cultivates essential life skills and a deeper understanding of diverse perspectives, ultimately fostering a more inclusive and equitable learning environment (Boardman & Hovland, 2022).

## **CHAPTER CONCLUSION**

In conclusion, the chapter on gamification, project-based learning, and innovative technology use in special education highlights the transformative power of gamification, project-based learning, and innovative technology usage in special education. These initiatives are not only transforming the educational landscape, but they are also causing a paradigm shift in how we see and support students with special needs.

The traditional rote learning approach to education is rapidly giving way to a more dynamic, interactive, and entertaining educational experience. This transformation is occurring not only in mainstream education but is also becoming an important tool in special education.

Educators are discovering untapped potential in kids with specific educational needs, as well as those who are smart and talented, by incorporating elements of pleasure and engagement into the learning process.

The essence of this chapter lies in the recognition that education is not a one-size-fits-all endeavor. Regardless of talents or challenges, every student needs a welcoming and encouraging learning environment. It is incumbent upon us, the future educators, to accept this communal obligation. By doing so, we can unlock each student's unique talents and potential, ensuring that no one falls behind.

The promise of innovative teaching practices offers hope for a brighter and more inclusive educational future in the UAE and beyond. We are not only revolutionizing education by continuing to research and apply these techniques; we are also nurturing a culture in which diversity is embraced and every individual has the opportunity to grow. The journey towards inclusive education is ongoing, and we can pave the way for a brighter future for all kids, regardless of their ability, through commitment and ingenuity.

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## **Empowering All Students**

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## ***Empowering All Students***

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## **KEY TERMS AND DEFINITIONS**

**Gamification:** The process of transforming typical academic components into gaming themes

**Inclusion:** Ensuring students with physical, behavioral, or learning disabilities are integrated into general education classrooms and are provided with support and accommodation to succeed alongside their peers

**Project-Based Learning:** An instructional approach designed to give students the opportunity to develop knowledge and skills through engaging projects set around challenges and problems they may face in the real world.

**Special Needs:** Educational requirements arising from a physical or intellectual disability or behavioral difficulties.



## Chapter 6

# Course Redesign for Authentic Learning and Active Citizenship: A General Education Course Context

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### ABSTRACT

*As society evolves and students' needs rapidly change, educators are expected to keep exploring strategies to enhance the teaching and learning process. This chapter documents the approaches adopted to redesign a general education (GNED) course to foster students' authentic learning. Using a qualitative strategy, data collection and analyses were done to determine students' views of education and how they will support innovation, drawing on the redesigned course. The results indicate a variation in male and female understanding of education and its purposes, even though they all generally see it as a tool for societal transformation. The results also show that students consider involvement in innovation in the country essential and highlight measures they will take, including awareness campaigns, nurturing younger generations, and preserving cultural heritage. Based on the results, implications of the findings for stakeholders, such as instructors and institution leaders, are shared.*

### INTRODUCTION

Changes in societies and students' needs require constant modifications in the teaching and learning process, including course redesign and pedagogical approaches. Specifically, course redesign is essential to accommodate any needed curriculum content modification to support students' meaningful learning and active social participation. In emergencies, the careful selection and intentional technology adoption to sustain learning quality for global transformation (Bernardo, Cordel & Calleja, 2023) will

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### ***Course Redesign for Authentic Learning and Active Citizenship***

be indispensable in course redesign. As Fink (2013) explained, course redesign allows tutors to rethink and modify their courses based on students' feedback and best practices shared by colleagues with the potential to promote inclusive learning environments. Fink (2013) added that redesigning courses would only be effective with relevant, measurable learning outcomes, appropriate pedagogies, learning experiences, and assessments aligned with the learning outcomes encapsulated in the revised course syllabus.

As General Education (GNED) courses assist students in developing transferrable soft skills to complement their core educational programs, educators have to keep examining means to enhance students' engagement (Aderibigbe, 2021). This endeavor will involve experimenting with active learning activities influenced by the authentic learning approach and constructivist pedagogical philosophy. As reported, educational institutions are increasingly exploring means to adopt active learning strategies to enhance teaching and learning with efforts focused on understanding and addressing learning space-related concerns (Talbert & Mor-Avi, 2019). The literature also indicates that authentic learning is a pedagogical approach that promotes discussions and exploration of concepts about real-world problems relevant to the student. It helps stimulate innovation to develop a fundamental foundation of vital problem-solving and critical thinking skills, which are mandatory in a real-life setting (Herrington et al., 2014; National Research Council, 1999). Implementing real-life practice and realistic learning tasks is viable means to strengthen students' engagement and motivation (de Lima, 2021).

In ensuring and promoting an authentic learning environment, students must have the opportunity to reflect on real-life experiences. Since the aim is to motivate students, stimulate their engagement, and strengthen their learning, an authentic learning environment must ensure the application of practical skills in the classroom. This enterprise prompts a thriving, authentic learning environment that yields positive and meaningful learning experiences through strategies such as problem-based learning, inquiry-based learning and simulations (Stanley, 2021). So, implementing an authentic learning approach aims to help students see a connection between what is learned in school and real life situations (Jandigulov et al, 2023).

Moreover, due to the COVID-19 pandemic, utilizing technology in education has been indispensably essential and will continue to play a pivotal role in post-pandemic education to aid and improve students' performance (Ploj Virtic et al., 2021). Various studies concluded that studying in a technologically enhanced environment has a more significant and positive impact on student learning and academic success than traditional learning (Brooks, 2011; Neuwirth, Jović & Mukherji, 2021). It has also been proved that incorporating technological devices and equipment in an authentic learning environment improves student learning behavior. Studies showed that the use of virtual reality (VR) and augmented reality (AR) are successful learning approaches that follow the criteria of an authentic learning environment (Utami et al., 2021; Chin & Wang, 2021). VR is a complete immersion in a digital environment, whereas AR layers devices on top of the natural world, thus enhancing what is being seen (Jung & tom Dieck, 2018; Elmqaddem, 2019). Despite this difference, the implementation of both VR and AR strives to promote interactivity and enable sensory sensations to develop the learning environment further.

In addition, the results of an experiment proved the potential of AR in increasing students' learning interest and improving their learning achievements in outdoor settings (Chin & Wang, 2021). Both studies concluded that students' motivation and interest have increased after implementing VR and AR in the classroom. Therefore, the innovative classrooms with e-learning and authentic learning has the power to advance student learning performance and academic achievements (Sumarmi., Bachri, Irawan & Aliman, 2021; Aderibigbe, AbdelRahman & AlOthman, 2023; Aderibigbe et al., 2022). With its characteristics, an authentic learning environment is grounded in the constructivist teaching and learning philosophy. As the literature indicates, the constructivist theory states that individuals do not learn

passively. Instead, they develop and internalize critical knowledge through the active construction of knowledge from experiences, as learning should not be an abstract concept but an engaging activity (Sutinen, 2008; Dewey, 1938). Learners would use their previous knowledge as a foundation to acquire knowledge by making connections for new learning. This process allows students to perceive concepts and construct responses based on their previous experiences and interactions with support from teachers (Von Glasersfeld, 1995).

Additionally, a constructivist classroom promotes interactive learning that builds on students' previous knowledge and encourages students to work in groups. There is room for flexible curriculum contents and learning activities as it is student-centered. Even though the teacher's role is not directive, the teacher helps the student construct their knowledge by answering open-ended questions and encouraging further discussions (Brooks & Brooks, 1993). The teacher's primary responsibility is to create a collaborative problem-solving environment where students become active participants in their learning. Student engagement and motivation are vital to achieving a constructive learning environment (Jayasinghe, 2021). Therefore, methods that include self-guided learning, peer teaching, and flip classroom are essential as they encourage student engagement and improve knowledge acquisition (El Hammoumi, El Youssef, El Bachiri & Belaouad, 2021; Sukrajh, 2018; Lewis, Chen & Relan, 2018). A study concluded that students respond positively to constructive learning that uses problem-solving and innovative learning in an authentic environment (Jayasinghe, 2021).

Since an authentic environment promotes the real-life practice, problem-solving, and critical thinking skills to real-world problems relevant to the student, it helps stimulate innovation to strengthen students' engagement and motivation (Herrington et al., 2014; National Research Council, 1999; de Lima, 2021). Implementing a constructivist education approach in an authentic environment will further enhance the learning process, thus leading to a deeper understanding of the content being learned (Turner & Baskerville, 2013).

However, maximizing the benefits of a new pedagogical approach will require the voices of students and contextual scholarship of teaching and learning (SoTL) informed classroom practices. Porter and Kustra (2011) describe SoTL as a process for determining measures to improve teaching and learning in the classroom, and the approach is gaining popularity in higher education. As Wiggins, Eddy, Grunspan, and Crowe (2017) argued, educators considering and planning for education using active learning pedagogies must engage in intellectual discussion with students and draw on their feedback.

Against this background and the need to continually strengthen students' learning, engagement in community services, and citizenship mindsets, the author redesigned a GNED course to enhance students' authentic learning experiences. With the need to foster citizenship spirits in today's diverse societies (Aderibigbe et al., 2023) and the evolving educational landscape due to COVID-19, redesigning courses to strengthen students' engagement becomes as essential as adopting technology. Thus, the course redesigning process ensures students' active engagement, interrogation of course materials, and application of knowledge gained in communities as functional and responsible citizens (Aderibigbe, 2021). In determining the impact of the redesigned course, the author also conducted SoTL-oriented research to gain insights into students' thinking about the concept of education and how they will authentically engage in the transformative process as responsible community members. The findings of this study can also provide relevant information to stakeholders in higher education program development and management, such as faculty, instructional designers, and academic department chairs. The next section of this chapter presents the research context. Afterward, the methods section is presented. The last two sections focused on findings and discussion, and conclusion.

## **RESEARCH CONTEXT**

This study was conducted in the context of a semi-private university in the United Arab Emirates (UAE). The UAE has seen a tremendous transformation in all spheres, including economic, social, educational, cultural, and infrastructural development (Martín, 2021; Braun, Moussa, Dafri & Stranjančević, 2019; Sonleitner & Wooldridge, 2014). For instance, its constitution protects the interests of both men and women as everyone has access to quality education and has the right to engage in any profession (Ministry of Culture, 2014). Sonleitner and Wooldridge (2014) also found that UAE parents appreciate the government's efforts in providing quality education, and some encourage their children to explore modern concepts without contravening their religious beliefs. Confirming the vital place of education in the UAE, His Highness Sheikh Zayed Bin Sultan Al Nahyan, founder of the UAE, noted, "The greatest use that can be made of wealth is to invest it in creating generations of educated and trained people (Warner & Burton, 2017, p. 15), as that is the way to create an inclusive and prosperous society (UAE embassy in the USA)." Out of respect and in memory of the late visionary leader, the current leaders of the UAE have allocated more than a third of the national budget to education. The UAE's Vision 2021 has a 'cohesive society and preserved identity as a national priority.

As Vision 2021 also has a 'first-rate education system' as its core element, educational institutions have to constantly improve their programs and complement the government's efforts to foster cohesion and identity preservation. Thus, this university encourages the regular review of programs and courses by constituting program development and accreditation committees across its colleges with the Dean-ship of Quality Assurance, Institutional Effectiveness, and Accreditation support. In its bid to bid to preserve cultural values, this university has both female and male campuses with classes run separately and collaboratively in concurrent order.

This study was conducted as part of the efforts to redesign GNED courses for optimal benefits to students at the university. In particular, this GNED course (Introduction to Education) taught in two classes was redesigned to enhance students' authentic learning through a restructuring process updating the course description, weekly content distributions, pedagogical approaches, and assessments. The description was modified, allowing students to develop knowledge and skills to complement the government efforts in promoting education for effective and responsible citizenship (Aderibigbe et al., 2023; Aderibigbe, 2021). In achieving this, the weekly content distributions were crafted to reflect the foundational, sociological, and theoretical lenses of education, along with their applications to promoting national priorities and global citizenship, including vision 2021 and the promotion of tolerance.

In facilitating students' learning, pedagogical strategies adopted were mainly grounded in the constructivist paradigm, offering them the opportunity to take leadership, responsibility, and ownership of the learning processes. The approaches employed include interactive lectures, in-class and online discussions, case analyses, inspirational learning design, podcasts, videos, and blended learning. Gamification using Kahoot was also employed for diagnostic feedback to determine the extent of students' prior learning experience and revisions in preparation for examinations. Learning assessments were mainly reflective and authentic, focusing on the high-order thinking spectra of Bloom's taxonomy, including application, analysis, and evaluation (Bloom, 1956). Table 1 shows the assessments' distributions in the course.

Having redesigned and taught the course, it became essential to explore students' reflective views about the course. The following research questions, therefore, guided the data collection and analysis procedures:

Table 1. Assessments' distributions

Assessment	Description	Weight
Reflective Online Discussion	<p>a. Drawing on this week's discussions and readings, write and share your short educational biography focusing on three key points.</p> <p>b. Reflecting on Dewey's thesis, why do you think it is important to allow children to confront problems as a strategy for helping them to learn?</p> <p>c. Watch the video clip below. Then make connections between the clip and the concepts of students' rights and responsibilities in the school system.  <a href="https://www.youtube.com/watch?v=nMxqEkg3wQ0">https://www.youtube.com/watch?v=nMxqEkg3wQ0</a></p> <p>d. Drawing on the video clip below, discuss at least two things you will consider doing differently to support the innovative and transformational agenda of the country.  <a href="https://www.youtube.com/watch?v=bTCD6Zvk4oU">https://www.youtube.com/watch?v=bTCD6Zvk4oU</a></p>	10
Individual Assignment	Reflect on your discussions on the philosophies of education and write your philosophy of education. In responding to the question, you should briefly explain your understanding of philosophy, your philosophy of education and why you believe in the philosophy.	10
Group Project and Presentation	<p>a. As an educator, you are asked to develop and facilitate an educational program on how people can stay safe in a difficult situation, such as disease outbreaks and earthquakes. Discuss the innovative instructional approaches that you will use to facilitate an educational program taking your philosophy of education and the characteristics of your audience into consideration.</p> <p>b. In this part, you will do a 3-5 minutes' creative presentation based on your write-up. You are expected to attend and engage with colleagues in all the presentation sessions.</p>	20
Exams	Midterm Exams	20
	Final Exams	40
Total		100

1. How do students describe education as taught in the redesigned course?
2. How do students intend to support the state's innovative and transformational agenda?

## METHODS

Drawing on the interpretivist research paradigm, the author elected to collect and analyze data for this study using the qualitative approach. As the literature indicates, the qualitative strategy offers the opportunity to unravel meaning (Roy & Brown, 2022), contextual interpretation and gain insights into the nuanced understanding of experiences (Brown, Kinder, Stang, et al., 2023; Silverman, 2017; Creswell, 2014). Additionally, qualitative exploration provides the opportunity to build theories and intrapersonal assessments (Gegenfurtner, 2019).

Using the purposive sampling technique, the author considered all the students in the two classes as participants in the study as they can all reflect to share their understanding, leading to the collection of rich data (Patton, 2002). Twenty-three male students were in Group A, while nineteen females were in Group B class. So, the facilitator-student ratio was moderate, allowing for seamlessly engaging collaborative and authentic learning activities in the classes.

In answering the first question, the author invited all students in the two classes to participate in an in-class online collaborative learning activity one after the other through a word art cloud platform (<https://wordart.com/create>). Specifically, students were asked to reflect on the course content and indicate what education means, given that art-oriented strategies are gaining more credence as an essential

## **Course Redesign for Authentic Learning and Active Citizenship**

research slant (Capous-Desyllas & Bromfield, 2018). DePaolo and Wilkinson (2014, p. 44) also argued that a word cloud presents “high-level data without information overload” in a graphical form, allowing readers or the audience to understand the ideas shared easily. Using this approach also assisted in creating visual representations of new knowledge produced (Capous-Desyllas & Bromfield, 2018) through a collaborative fun-packed learning exercise. Additionally, collecting qualitative data online adds value to the process of undertaking qualitative studies (Falter, et al., 2022).

In answering the second research question, all the students were asked to engage in reflective online discussions, but the last discussion was retrieved and analyzed. Although all the learning and assessment engagements allowed students to demonstrate the knowledge gained in the course, online discussion four mainly allowed them to highlight how they would support the country’s innovation agenda post their class experiences.

To analyze the data, students’ sentiments were read severally for immersion and deep insights into their thoughts. Then, the author organized their views inductively into themes using the color-coding approach for different segmentations based on the commonality of nuanced expressions and importance (Bianco, Gasparini & Schettini, 2014). It is essential to highlight that the study was conducted following the ethical standards of scientific organizations. For instance, the author sought and got the approval of the College’s scientific research committee to undertake this study while students were asked to indicate if they did not want their data retrieved and analyzed. As it was explained to them that the study would have no negative implications on them but rather assists in enhancing the teaching and learning process, they all indicated that their data could be tapped and analyzed (Musah et al., 2023).

Further, students were not forced to participate in the synchronous in-class collaborative learning activity and asynchronous self-paced course assessment endeavor. Students’ names are not mentioned in any portion of the report to safeguard their privacy. As shown in the results section, G represents ‘group’ while S stands for ‘student.’ So, G1S2 stands for Group 1, Student 2 in the group. The data used in this study are retrieved after their final results have been posted without revising their achieved grades. Extensive discussion following collaborative learning, where new thematic ideas were created through the word cloud, also lends trustworthiness and dependability to the study (Bianco et al., 2014; Lincoln & Guba, 1985). More so, membership checking was done through a reflective discussion of the themes emerging from students’ contributions to the second question (Patton, 2002).

## **RESULTS**

### **Students’ Reflection and Understanding of the Concept of Education**

In describing what education means, students reflected on their understanding, learning, and community socialization process to articulate their nuanced thoughts, with the most significant views highlighted in Figure 1.

On the right side, the critical interpretations of education are power, right, knowledge, journey, and respect, from the female students’ perspectives. On the left side, the essential ideas are a medium of initiation, future-proofing, the future generation, creativity, and information for the male students. Beyond their conceptualization and understanding of the concept of education, students also expressed their views on how they will use their knowledge to support the country’s innovation drive in the following sub-section.

Figure 1. Students' descriptions of education



## How Students Intend to Support Innovation in Society

In terms of how students will support the country's innovation agenda, drawing on their knowledge of the redesigned GNEC course, five themes emerged from the data analyzed. The themes and their supporting vignettes are as follows:

### Encouraging Others and Spreading Awareness

Students indicate that they will encourage others and spread awareness on the need to see value in the innovation agenda of the country. This sentiment is enunciated as follows:

*The first change I will make is basically make more people aware of this concept by actually making them test it out themselves and making them involved. That is by encouraging them to be creative and make them feel like their ideas and creativity are worthy (G1S1)*

*I believe that my support for my country and its innovations is to spread awareness in order to increase young innovators, given that they are the most intellectually and imaginatively active group, and their opinions may help a lot in developing this field in the UAE. (G2S6)*

In addition to spreading awareness, they also indicated that they would encourage others to learn more about innovative ideas that could impact them and their communities positively:

*One of my dreams is to become a writer and inspire others with the art of words. Spreading positivity to me is very important. I advise others to do the same because if we all supported each other while achieving our dreams, we would create a civilized and innovative environment. (G2S1)*

## **Course Redesign for Authentic Learning and Active Citizenship**

As the data indicate, students did not only intend to spread information about the relevance of innovation but also encourage people to read about it. They also intend to draw on their subject matter expertise to promote innovative practices.

### **Focusing on the Younger Generation**

Students see the need to focus on children as an important move for all active citizens and residents to complement the government's efforts to foster society's innovation. The sentiments are expressed as follows:

*We have to focus more on the coming generations because these are the people who will carry on our country in the future. Being ready and building up the coming generations makes the country more innovative. (GIS2)*

Explaining the point further, they indicated that the government, community, and individuals must be actively involved in preparing the younger generations for the future:

*I will make sure to teach everyone how to save water. Even my children, I will teach them ways on how to save water as much as they can. It is really a valuable thing that we should all care about because without water we can't live. (G2S2)*

*My first change that I'd like to incorporate is to focus on future generations and the youth of the country. They are the fruit of all this labor and hard work and with this rapid development, I'd recommend that the youth and children should be raised and taught well because they are the future of this country. (GIS4)*

Drawing on the data above, it is clear that students feel it is imperative to pay attention to future generations. In their views, focusing on the children who are future generations and leaders is indispensable in sustaining the path of innovative growth and transformation drive in society.

### **Researching and Preparing for a Sustainable Future**

Students also believe it is crucial to seek knowledge about how to enhance environmental sustainability. This sentiment is expressed as follows:

*My second change is that the country should focus more on sustainability and prepare for the devastating yet inevitable economic crisis that strikes the globe every decade or so. This will give the UAE residents ease of mind. (GIS4)*

*... individuals can prosper by including innovation in their planning and thinking, and especially by supporting the country's agenda of sustainability. (G2S8)*

Providing an example of aspects of sustainability, a student explains as follows:



*Water resources are very important to the whole world. And I believe we should all care about it and not waste it. I feel the ones who keep wasting water are very selfish and don't think of the next generations. (G2S2)*

As the data show, a country must have innovative agenda, but it is more important to pay attention to strategies for environmental sustainability. So educating and leading by examples are measures for all to consider in ensuring environmental sustainability and societal innovation.

## **Preserving Cultural Heritage and Culture**

Students feel strongly about the need to promote and preserve cultural heritage in the face of innovative measures for transforming society.

*Firstly, countries should preserve their history and culture more than they are today. (G1S5)*

*Countries nowadays should care more about their history and culture than what they are today. (G1S16)*

Re-echoing the sentiment and acknowledging the roles played by the founding fathers, a student indicates thus:

*The present kids' program that is accessible in the country is from the advancement our founding fathers saw through a dream to build up a way with the goal that all youngsters and grown-ups get education for nothing to help the eventual fate of this nation, and it figures out how to incorporate the local qualities and customs into the kids' programs (G2S13)*

Other students explain that changes may be challenging because of the fear that cultural values may be trampled upon and also reinforces the view that the country is open to innovation in line with the leaders' visions:

*People criticize change and are sometimes afraid to try new things just because they don't want to risk losing their beliefs or changing their point of view. The UAE has opened the doors of innovation to everyone because they believe in creativity and innovation within all ages and societal groups; they think that the differences are based on the way of thinking and development and not on money or appearances. (G2S6)*

*It's always hard for a country to make that crossover from old and traditional to new and advanced because people of older generations who have been there since the very beginning may struggle with the fact that a country must be dynamic for the new generations to adapt and flourish. Therefore, it is in our hands to transmute. A government can mainly accommodate more recent generations through innovation and transformation. Moreover, innovation requires more than one entity to be put in order. (G2S3)*

As the data reveal, preserving cultural heritage is as essential as innovation in society. However, there could be resistance to change, which could be addressed by the government and individuals to key into innovative drives irrespective of their generations or age demographics.

## **Course Redesign for Authentic Learning and Active Citizenship**

### **Committing to Continuous Learning and Educational Fairs**

Lastly, students indicate the willingness to commit efforts toward their education and attendance at educational fairs as measures for sustaining innovation. As seen below, students consider a priority to their education and learning as essential:

*The first step that I will take to aid the country's innovative and transformational agenda is putting studies as my number one priority so that later in life, I will be able to apply my knowledge and experiences to innovative environment's. I will also put effort into participating in competitions and contests that encourage innovation. (G2S3)*

*Personally, I am aiming to facilitate this process by engaging and committing myself to my studies in hopes of becoming the individual needed for the betterment of myself as well as society as a whole. (G2S7)*

Reinforcing this sentiment, students indicate a commitment to their education, and strengthening their knowledge in specialized areas of expertise can help them complement the government's efforts to sustain innovation:

*To support my country's transformational and innovative agendas, I will work to be more competent in my field of study in ways, such as using my Mass Communication major as a means to suggest innovative ways people can utilize media technology and news outlets and in this way I am contributing to societal change. I will also do my best to participate in UAE's events or fairs that encourage competitiveness in innovation in various fields. The country has made it easier to be a part of it through social media channels. (G2S8)*

*I will further my dedication to my field of study, international relations, as well as building more interests outside of that one field and stepping out of the box where I may have placed myself. I believe that all individuals can produce change and better their surroundings. No matter how small or insignificant these changes may seem, when looking at the bigger picture, massive improvements are made out of a great collection of small efforts. (G2S4)*

*I will proudly participate more in the innovative courses, be part of the science fairs and competitions that take place in the country, and show my support. (G2S13)*

*I would also participate and engage more in the competitions and fairs of the country and attend them more frequently to show my support (G2S5)*

From the data, it is evident that students see the need for an ongoing commitment to learning by focusing on developing knowledge and transferrable skills through their university programs. In addition, they need to attend competitive educational fairs to triangulate relevant information received through cultural socialization and formal learning at schools. Based on the data, it is fair to suggest that redesigned courses can enhance students' learning.

## **DISCUSSION**

In this study, all the students acknowledged the value of education as essential for individual and societal growth. Collaboratively, they see education as a tool to foster creativity and information sharing through a helpful learning journey. This finding correlates with the thinking of the UAE society and its leaders about education. Sheikh Zayed AlNayan, described education as a worthy investment to create generations of enlightened people and an inclusively prosperous society (Warner & Burton, 2017; UAE embassy in the USA, nd.). As Sonleitner and Wooldridge (2014) also found, UAE parents treasure the government's noble act of providing quality education and encouraging the protection of cultural heritage. Notwithstanding, the values and conceptions of education appeared different, as Figure 1 shows a variation in female and male students' contentions. For male students, education is seen chiefly as initiation, safeguarding the cultural practices (heritage), and preparing the future generation. This revelation might be unconnected with the cultural tradition of placing a considerable responsibility on men to ensure that kids are given adequate education, protected, and socialized according to societal values in this study's context. Not surprisingly, students indicate the need to focus on future generations and the preservation of cultural heritage as their essential roles in fostering and sustaining innovation. As earlier mentioned, the UAE society encourages the adoption of modern ideas and cultural diversity without crossing cultural boundaries (Sonleitner & Wooldridge, 2014) and safeguarding cultural identity (UAE Vision 2021).

On the other hand, the female students described education significantly as a tool for gaining power, knowledge, and rights. This finding could be connected to the government policy promoting equity and quality among men and women within the country, with many women now occupying exalted positions, which was not the case in the past (Warner & Burton, 2017). So, education is seen as a tool for promoting women's interests and right through the development of knowledge, which could translate into having the power to compete favorably with contemporaries irrespective of differences. Perhaps, this explains why the need to demonstrate willingness and commitment to ongoing education and educational fairs is expressed by only female students who consider such an endeavor as their crucial role in promoting societal innovation and transformation. Besides, this may also explain why some students are willing to raise awareness about the importance of innovation and the need to be open to innovative ideas as lifelong learners.

The fact that students see the need for promoting environmental sustainability also indicates that the redesigned course assisted them in developing critical thinking and problem-solving transferrable skills required in the 21st century. This finding conflates some previous studies that students do not see much value in GNED courses and reinforces other studies that GNED complements core courses in assisting students in developing soft skills to distinguish themselves as responsible community members and professionals in the future (Aderibigbe, 2021). Employability skills, such as communication for articulating good courses and scaffolding skills to inspire and nurture younger generations or novice professionals, are also necessary for students to sustain employability in today's competitive economy. Not surprisingly, the UAE invests more than half its budget in education (Warner & Burton, 2017). In assisting students in making the most of their class contents and innovative pedagogies, instructors must consider compassion and interactive teaching pedagogies informed by constructivism, including technology-enabled learning spaces (Aderibigbe et al., 2022). These findings, therefore, reinforce the need for instructors to employ authentic learning activities influenced by the constructivist pedagogical

## **Course Redesign for Authentic Learning and Active Citizenship**

philosophy and appropriate application of technology (de Lima, 2021; Neuwirth et al., 2021; Chin & Wang, 2021). Instructors as mentors and facilitators must also demonstrate understanding and empathy to students, suggesting that educators genuinely care for students' authentic learning and development of skills for active citizenries.

## **CONCLUSION**

This study investigated students' views of a redesigned GNED course using the authentic learning design guided by the constructivist pedagogical paradigm. From the findings, students acknowledged education as a tool to prepare them for a better future, considering the cultural context, and appreciated the redesigned GNED course. Drawing on the course, students acknowledged and clarified essential roles to promote and sustain societal innovation, including raising awareness, directing efforts toward the younger generations, and committing to lifelong learners' philosophy.

This study has limitations, which include the sample size and focus on one learning context, but it aligns with the goals of SoTL as it sought students' views to determine measures for improving teaching practices (Potter & Kustra, 2011). It also has implications for stakeholders in higher education. For instance, it re-echoes the need for educators to constantly review courses and encourage authentic learning design influenced by constructivist pedagogies offering students meaningful and authentic learning experiences to get desirable outcomes. University management and instructors teaching core departmental courses must provide an enabling and supportive environment where students are encouraged to dedicate time to GNED courses for maximum benefits. Hopefully, future studies will build on this study using large sample sizes and multiple research approaches, such as quantitative and mixed methods strategies.

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Section 2

# Innovation in Leadership



# Chapter 7

## Bridging Innovative Technologies With Progressive Educational Governance

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### ABSTRACT

*Education today necessitates modernization through the latest digital tools and technologies. The integration of EdTech and leadership is crucial for advancing modern education. To effectively apply technology in educational institutions, understanding the role of leadership is essential. Education reforms are underway to stimulate innovation and enhance digital technology use, focusing on flexibility, student-centric approaches, and visionary leadership. Notable entities like UNESCO and Khan Academy are at the forefront of promoting comprehensive professional growth. Leadership styles, such as distributed, transformational, and visionary leadership, are pivotal in adapting to new technologies. The technology divide, marked by uneven access to devices and the internet, remains a significant challenge, often amplifying educational disparities. Adapting to new educational environments poses challenges for educators, necessitating that educational leaders prioritize stress reduction activities, collaboration, and a supportive work environment for teachers.*

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## **INTRODUCTION**

### **The Convergence of EdTech and Leadership in Modern Education**

Education needs to get transformed with time so that the latest technologies can be used. In today's world the convergence of EdTech and leadership is necessary for developing modern education. In general terms EdTech is all about enhancing the use of latest technologies and integrating the digital tools in the education (McCarthy *et. al.* 2023). It is important to understand that use of digital platforms can help both the students and educators in getting better personalised experience and tailoring the education as per the needs and preferences of the student.

Along with this EdTech can really help the leaders in making more data driven decision related to the progress of the students and adapting the new strategies. Effective data driven leadership can really help in making the best use of resources which is required for effective professional development of the students (Mwita and Joanthan, 2019). This report will elaborate about the need for having effective convergence between leadership and EdTech in education. Also the report will state the potential challenges and opportunities related with bridging of innovative technologies with the progressive educational governance.

### **The Significance of Progressive Governance in the Age of Digital Learning**

In today's era education needs to be transformed with the best possible digital tools and technologies. Here the leadership and governance plays a major role in continuous improvement and innovation in the education sector (Qablan et al., 2023). Progressive governance can help in adapting the new policies and agile decision making for ensuring that quality education is being offered by the students. Along with this progressive governance support innovation, technological advancements and foster digital literacy which is important for digital transformation in the education (Ramadan & Ismail, 2023). Moreover it can be said that progressive governance is important for bridging the use digital devices and preparing the students for a future in which education is more dynamic.

## **THE NEW AGE LEADER: CHARACTERISTICS AND QUALITIES**

### **Traits of Leaders Who Successfully Integrate Technology in Education**

Leaders need to have effective skills for successfully integrating the use of technology in the education sector. According to Roth and Price, (2016) for successful implementation of the technology in the educational institutions it is necessary to understand the role of leadership (Ibrahim et al., 2024). In this study the researchers has stated that for having better educational transformation it is necessary to understand that strong leadership is required at national, regional and school level. When the leaders at all level work effectively towards the transformation with better decision making, collaboration and teamwork then the implementation of technology becomes easier.

As per the views of Prestiadi, *et. al.* (2020) Successful leaders who incorporate technology into the classroom have a few essential characteristics. They exhibit a distinct understanding of how technology can improve learning while making sure that it is in line with academic objectives. They are flexible, willing to try new things, and keep up with the newest developments in their field. Their ability to effec-

tively communicate helps them convince all parties involved of the value of technology, which promotes buy-in. In order to involve parents, instructors, and students in the integration process, cooperation and teamwork are crucial (Beteille, *et. al.* 2020). They place a high priority on professional development, helping teachers acquire the required IT skills. Finally, they are data-driven, modifying methods in response to analytics that assess the influence of technology on student results (Almaktoum & Alkaabi, 2024; Badawy & Alkaabi, 2023; Ismail et al, 2023).

There are some of the important leadership traits which are required by the leaders for adapting the changes and bringing transformation in education sector (Alkaabi, 2023; Alkaabi et al., 2023). As per Mupa (2015) the leader needs to have visionary thinking which can enable them in understanding the need for educational transformation and this can help them in having clear vision for the use of technology for enhancing learning. In addition to this the leader need to focus on data driven decision making which can help the leaders in making informed decisions related to the technological integration in education. For the leaders paying attention over EdTech incorporation it is necessary to have better collaboration with all the other stakeholders for making collaborative decision related to the seamless integration of technology. Miller (2019) has stated that in the digital transformation in education effective communication and collaboration of the leader is required for having supporting work culture in the educational institutions which is important for promoting better technological advancements.

As per the views of Day, *et. al.* (2020) the leaders need to be more effective when it comes to school leadership. The researchers has mentioned that school leadership is having a major role to play in overall school culture, teachers and support which is being offered to the students. In this context the researchers has mentioned that school leaders need to have adaptability skills and should focus on empowering the teachers in adopting the new technologies into their teaching methods. In opportunities to this the leaders also need to look after offering better change management with transformational leadership to the students. All these leadership traids are important for offering quality education to all the students and fostering improvement in the educational institutions.

### **The Importance of Adaptability, Vision, and Student-Centricity**

In today's education sector multiple changes are being made for fostering innovation and increasing the leverage on the digital tools. But while doing this the leaders needs to ensure that they are paying attention over adaptability, student centricity and vision for making the implementation of EdTech more effective. According to McKnight *et. al.* (2016) all the decisions made by the leaders for innovation in the educational institutions needs to be based on the students' needs and preferences. When the approach of leaders is student centric then only it can help in improving the overall quality of education.

Whenever any change is being implemented in the education second it is necessary to have goal setting and clear vision. Bringing digital transformation in the system is a complex process which needs to have clear vision and goal so that it can be executed in an appropriate manner. In this context Carvalho *et. al.* (2022) has stated that the leader need to be visionary for achieving the innovation goals related to the use of latest technologies and fostering EdTech in the educational institutions. The educators, teachers and educational leaders needs to understand that adaptability is also very important for remaining ahead of the competitors and offering high quality education. According to Nunez-Canal *et. al.* (2022) with technology constantly advancing it is necessary to ensure that educational leaders should be flexible and should focus on adapting the new tools and methods for offering better quality education. Also this report has stated that during the emergency situation of covid-19 also adapting with the change and

working with the new normal of learning and teacher has become important. Although implementing the changes is complex but it is important to be adaptive and to respond to the changing trends and shifting student needs.

## **LEADING THE CHARGE IN EDTECH INTEGRATION**

### **Strategies for Introducing and Implementing New Technologies in Educational Settings**

Globally integrating new technology into educational settings is a complex process that needs careful preparation and execution out. This transforming approach is supported by four crucial strategies: Internationally renowned organisations like UNESCO and EdTech giants like Khan Academy are at the cutting edge of the importance of complete professional growth. As per the view of Maya-Jariego, *et. al.* (2023) these organisations place a strong emphasis on providing teachers with a wealth of resources and instruction, which enables them to successfully incorporate new technology. For example, Khan Academy offers no-cost online training and resources to teachers, helping them to improve their electronic instructional skills and facilitate the easy incorporation of technology into the learning environment. Law, and Liang, (2019) further argues that prominent institutions such as the United Nations, that works to close the digital gap, have adopted ubiquitous accessibility as well as equity as core objectives. The necessity of providing equitable educational possibilities regardless of geographical or socioeconomic disparities is highlighted by efforts including the UN's Sustainable Development Goal 4 (Quality Education). Encouraging equal utilisation of educational resources requires a strong focus on leveraging technological advances, such as offering inexpensive ipads and connectivity to the internet in underprivileged communities.

Organisations like the World Bank, promote its use in education, have given data-driven choices respect on a global scale. Data on how students do may be gathered and analysed by using technology such as educational management systems (LMS). As seen by the World Bank's financing of education technology initiatives in nations that are developing, this method based on data enables educational organisations to tailor teaching according to student requirements, leading to noticeable increases in learning results. Baggio, (2019) stated that in the field of implementing technology in education, cooperative partnerships—supported by entities like the Global Economics Forum—play a crucial role. Creative solutions are produced through partnerships between governmental organisations, businesses, and charities (Mkhlze, and Davids, 2021). In order to make investments in educational technological innovations that enable learners and educators worldwide, for instance, the Global Business Coalition for Education works with international firms.

### **Case Studies of Successful EdTech Integration Led by Visionary Leaders**

Sal Khan and Khan Academy provide a noteworthy illustration of how innovative management may successfully integrate EdTech. Established by Sal Khan in 2008, Khan Academy is a well-known organisation that provides an extensive library of online gratis educational materials. Former investment firm analyst Sal Khan saw a future in which everyone, everywhere, might have access to excellent schooling

through technology. His creative use of EdTech included developing a platform that gave learners access to a variety of practise questions, explanatory films, and individualised learning resources.

Ersozlu, *et. al.* (2022) has stated in their study that millions of students globally are served by Khan Academy which has expanded into a global phenomenon beneath Sal Khan's inspirational guidance. His dedication to offering free, excellent schooling has not merely upended the status quo regarding learning but has additionally handled concerns of availability and equality. By using statistics to determine how pupils engage best, Khan Academy has been able to consistently improve its course offerings using his data-driven methodology. Peurach, *et. al.* (2022) further critically stated that moreover, Khan's leadership has encouraged partnerships with educational organisations, instructors, and schools, enabling the simple incorporation of Khan Academy's materials into a range of learning environments. Ingenious approaches have been developed by educators to incorporate these materials into their lesson plans, resulting in educational models and individualised learning opportunities. Sal Khan has transformed Khan Academy into a major player in the EdTech industry with his innovative administration, emphasis on informed by data development, and dedication to equal entry to education (Swartz, *et. al.* 2023). He has provided an inspiring instance showing how innovative administrators may promote effective EdTech integration on an international scale with his commitment to continuously improving the tool and his conviction that technology has the ability to revolutionise schooling.

## **CREATING A CULTURE OF CONTINUOUS IMPROVEMENT**

### **The Role of Leadership in Fostering a Growth Mindset Among Educators and Students**

Leadership is having a pivotal role in promoting continuous innovation and improvement (Alkaabi & Almaamari, 2020). When it comes to education sector then there is a need to have effective leaders for fostering the cultural of innovation and continuous improvement in this sector. According to Mesler, *et. al.* (2021) the educators and the educational leaders are having a significant role to play in shaping the mind-set of the students. In this study the researcher has highlighted that it is necessary for both the students and the educators to have a growth mind-set which can enable them in learning new things and adapting the use of new technologies for improving the overall quality of education (Baldwin *et. al.* 2020). Moreover the study has suggested that the teachers needs to promote the students to try multiple study material and use different learning methods for bringing continuous improvement in the learning and education. In support to this Kroeper, *et. al.* (2022) has mentioned that the attitude and behaviour of the teachers also affect the mindset of students towards growth.

As per the views of Purwanto (2021) the leaders needs to focus on developing an culture of innovation by offering feedback and offering space for risk taking in the educational environment. When the students and the educators are having space to take the risk then it helps them in being more innovative. In addition to this Ferine, *et. al.* (2021) has added that in the educational setting it is necessary for the leader to create a culture of innovation. When the student and teachers are innovative and having a mind-set of trying new things, then it helps them in bringing digital transformation in the education system. Along with this it enables the leaders in motivating the teachers to adapt the changes related to the use of new technologies in the educational institutions.

## **Techniques for Promoting Innovation and Adaptability in Learning Environments**

Encouraging students and educators to adapt the changes and work over innovation is a difficult task. In this context Oke and Fernandes, (2020) has stated that it is important to offer effective training to the teachers related to modern educational methods and technologies which can help them in adapting the changes. Along with this the leaders should offer supportive leadership for motivating the teachers or the educators to make effective use of the innovative teaching methods and practices. The researchers has stated that all this can help the teachers in having better insight about paying attention over the use of technology-driven innovation in the education sector. As per the views of Cheung, *et. al.* (2021) bringing innovation in the learning environment offers multiple challenges and opportunities for the educators. In this context the study has highlighted that the technologies such as smart learning environment with better technologies can help in improving the learning environment.

According to Garzón Artacho *et. al.* (2020) there is a need to promote the use of digital tools in the educational institutions for bringing innovation in this sector. With time every organisation operating in diverse industries are making the best use of technology. Here the leaders of education sector also need to emphasize over the use of digital tools in the learning process. For example, smart classes, online teaching, educational application and virtual reality are some of the effective technologies which can bring great innovation in the educational institutions. These technologies can really help the students in getting more interactive and adaptive learning experience which improves the overall quality of education.

## **DISTRIBUTED AND TRANSFORMATIONAL LEADERSHIP IN EDTECH**

### **Exploring New Models of Leadership That Support Technology Integration**

For being digitally advanced it is necessary to have effective leadership in the organisations for better transformations. There are diverse models of leadership and leadership style which are being employed for technological integration in the organisation. But when it comes to educational setting then it is necessary to pay attention over using effective leadership model which support collaboration and prioritises adaptability. Matsunaga, (2020) has mentioned about the tech savvy leaders who are having the ability to support the team in adapting new technology with clear objectives. Along with this Tech Savvy visionary leaders can help in representing the need for data driven decision making while paying attention over technological innovation.

When it comes to leadership in schools or the educational institution then leadership styles such as distributed leadership, transformation, visionary leadership, etc are also effective in adapting the new technology. Brown, *et. al.* (2020) has mentioned in their study about the use of distributed leadership for innovation in schools. In this study the researchers has stated that schools are more networked due to which it is important for the leader to support the mobilization of networked driven innovation. The study has concluded that distributed leadership should be used in the right manner for offering better support the innovation in the schools.

## **The Benefits of Distributed Leadership in Decentralized Tech-Driven Settings**

Lumby (2019) has stated in their stated that distributed leadership is one of the effective leadership styles which can help in making the changes successful and working over innovation. This leadership helps the leaders in fostering the culture of innovation in the team which is important for adapting the latest technologies. According to Mohebi, (2019) when it comes to educational leadership then the educators needs to make use of distributed leadership as it suits well for the tech driven setting. In the educational sector if distributed leadership is being used then it helps in sharing the roles and responsibilities for making quick changes. Along with this it helps in having a culture which is ready to accept the change and get benefitted from the same.

When it comes to educational sector then it is important to understand that single leader cannot make all the decisions related to the implementation of EdTech in the education sector. This sector is decentralised which needs to be managed in a collaborative manner with the concern of all the important stakeholders. According to Torres (2019) distributed leadership is effective as it helps the leaders in sharing the responsibilities and helps in doing work in a better way. Along with this distributed leadership helps in having expertise guidance with specific knowledge and skills. It can be said that when various leaders are contributing to the transformation then it help in addressing the challenges related to technological adaption in a better way.

## **Transformational Leadership and its Impact on Tech Adoption and Innovation**

Philip (2021) has stated that transformational leadership is one of the effective leadership styles when it comes to adoption of technologies and being innovative. In addition this the researchers has mentioned that transformational leadership helps in making changes more smoother with effective collaboration and teamwork for making change more efficient. In support to this Prestiadi, *et. al.* (2020) has stated that the role of transformational leadership has changed a lot in the education 4.0. The education 4.0 is all about making use of latest technologies and bringing technological advancements in the area of education. For this, transformation leadership is required which can enable in increasing awareness among stakeholders for better technological advancements in the education processes.

According to Waruwu, *et. al.* (2020) transformational leadership is having a positive impact on the innovation capacity of the schools. The research has conducted the data from the teachers in Indonesia related to the impact of transformational leadership on innovation. The result of the study has shown that transformational leadership is having a positive effect on the ability to adopt the new technologies and to work over innovation. Along with this transformational leadership support the educators and teachers in improving the readiness of the teachers to adapt the tech changes related to the education methods and techniques. In support to this Anthonopoulou, *et. al.* (2021) has stated that transformational leadership is important for tech adoption. When the education institutions are having leaders with effective transformational leadership then it enable the stakeholders to adapt the latest technologies such as Artificial intelligence, machine learning, digital platform and internet of things in an effective manner (Alqodsi et al, 2023).

## **CHALLENGES IN BRIDGING EDTECH AND LEADERSHIP**

### **Potential Obstacles Faced by Leaders in Merging Technology and Education**

When combining technologies with education, leaders encounter a number of challenges. It is necessary to understand that ensuring better support from all the stakeholders is not easy for the digital transformation in the education sector. Because of this reason there are multiple changes which are being faced while merging technology into education (Sheninger, 2019). Due to the fact that uneven availability of gadgets and the internet can worsen gaps in education, the technological divide continues to be a serious problem. As per the view of author common barriers include educator ambivalence to change, worries about increased demands, and the possibility of job relocation. Adoption of modern technologies is sometimes hampered by financial limitations, as expenditures for career growth, programmes, and equipment arise. According to Nambisan *et. al.* (2019) for the educational institutions it is necessary to have enough capital to buy all the required resources for implementing the use of new technology. Here the leaders and the financial team need to ensure that they are having enough funds to bring the digital change in the education institutions. So the study has concluded that lack of funding can be one important challenge related to the implementation of EdTech.

Leaders have to deal with complicated regulations regarding data confidentiality and safeguard data about pupils, which raises concerns about security and privacy (Pandita, and Kiran, 2023). Unplanned technology deployments and unclear strategies might impede development. Technological issues that interfere with learning include mismatches and failures of the system. Parry, and Viviers, (2023) argues that since the efficiency of the many instructional technologies available varies, monitoring of quality is essential. It is risky to place too much emphasis on technologies at a cost of essential abilities like thinking critically and being imaginative. In addition to addressing these challenges, successful executives must place a high priority on fair access, simple integration, and a well-rounded strategy that improves the schooling process in its whole (Dasruth, 2020). Not only is this resistance to change also an important obstacle which might be faced by the leaders while making use of technology. In this context Almaiah *et. al.* (2020) has stated that during the implementation of E-learning several universities has faced major issues related to the resistance to change. Here it is important to understand that every student is different and due to this reason change to resistance can be a major issue while merging technology with education. Lack of digital literacy is one of the major reasons behind change resistance in terms of implementation of new technologies (Alqodsi, 2023).

### **Strategies to Overcome Resistance, Budget Constraints, and Training Gaps**

Leaders need to use an integrated approach to get around opposition, budgetary restrictions, and skill deficiencies when integrating technology in education. Successful interaction is essential first. In order to address worries emphasize the advantages of the internet, and include participants in the decisions they make, leaders should interact with teachers, parents, and pupils alike. Phakamach, *et. al.* (2023) stated that opposition can be reduced by showcasing the beneficial effects of technology on educational activities via successful case studies and examples from everyday life. Budgetary restrictions can be lessened by allocating resources strategically. It is recommended that executives look into grants, col-



laborations, and economical alternatives (Freiman, 2020). They should also make sure that money are allocated to technological projects with significant effects and rearrange current expenditures to make room for essential costs. Finding charitable assistance, working with nearby companies and towns, and pursuing partnerships can all aid in obtaining more money. It takes an intensive professional development programmer to bridge training gaps (Alqodsi & Aljahoori, 2023).

Leaders have to make continual training investments that take into account the various abilities of teachers. Tigere, (2020) further argues that opportunities for relevant, practical, and customized training have to be readily available. Support groups with peers and mentoring programmers can also help instructors share expertise with one another. If effective training and better support is being offered to the educators then it can help a lot in reducing the chances of change resistance and can help in having culture which is ready to accept the change. Additionally, executives ought to foster an innovative culture that honours ongoing education and flexibility (Pucciarelli and Kaplan, 2016). Promoting experimenting and recognising the endeavors of educators who adopt technology might cultivate a more optimistic outlook on its incorporation.

## **TEACHER RETENTION IN THE DIGITAL AGE**

### **The Importance of Supporting Educators During Technological Transitions**

Whenever technology is being integrated in the education then one important factor which is being overlooked is to support the educators. Adapting to the changes and adjust in the new teaching environment is never easier for the educators. According to Dolighan and Owen, (2021) during the transitional shift towards online learning not only the students but the teachers have also faced a lot of issues. Teachers need to get effective training and supporting while undergoing through digital transformation into the education especially when the changes takes place in the teaching methods and techniques. The large educational institutions such as Khan Academy and other needs to understand that it is very crucial to offer effective training and better support for making teachers feel empowered and confident through with the transition. This can help them in learning the new skills and knowledge for using technology in a better way and embracing innovation as well.

Beteille, *et. al.* (2020) has mentioned about the need of support for the educator during transition as they face stress. In this study the researchers has highlighted that whenever the change is made in the teaching methods then it offers great stress to the educators in adapting the new technology and working according to it. For this the educational leaders need to emphasize over involving the teachers in the stress reduction exercises and offering collaborative and supportive work culture (Gautam and Gautam, 2021). All this can help them in making changes easier for them and adapting to the change successfully. In addition to this Haleem *et. al.* (2022) has stated that if the educators are not being supported well during the digital transformation then it leads to job dissatisfaction and resignation. So here the researcher has stated that offering better support to the educators is crucial for reducing issues related to retention of teachers due to digital transformations. Moreover it can be said that the educators are the important stakeholders which needs better support, training and leadership for adapting to the change in their teaching methods.

## **Leadership Strategies for Ensuring Teacher Satisfaction and Retention in Tech-Enhanced Settings**

Educational institutions need to offer better support to the teachers while paying attention over the use of latest technologies. For example the educational institutions like Khan Academy also faced the issues related to employee resistance to change. In this context Srivastava and Agrawal, (2020) has stated that while making changes it is necessary to understand that all the important stakeholders should be ready to accept the change. If the employees of the company resist the change then it will not offer fruitful benefits to the company. Similarly when use of technology is being increased in the educational setting then it leads to dissatisfaction among the teachers. According to Hennessy, *et. al.* (2022) it is important to offer better support to the teachers while increasing the use of technology in the educational institutions. This report has suggested that it is important to offer effective training and support to help the educators in being proficient with the use of technology. Along with this it is important to have a culture of collaboration among all the teachers which can help them in learning from one another and adapting the technological changes in an effective manner (Abdallah et al, 2023).

Different leadership strategies need to be incorporated for ensuring teacher satisfaction and retention in the tech enhanced settings. According to Li and Yu, (2022) feedback and evaluation is important for ensuring better teachers support in adapting the new technologies. The educational institutions and the leaders should emphasize over collecting feedback from the teachers and evaluating the growth which can help in identifying that the new technology is helpful or not (Oliveira *et. al.* 2021). Along with this regular feedback also helps in improving the quality of education and enhancing teacher satisfaction with their jobs. Here it can be said that the educational institutions need to evaluate the results of the new technology or the digital tool implemented for knowing the effectiveness of the new tech.

## **CONCLUSION**

### **Reflecting on the Future of Education With Progressive Leadership**

Based on the above stated report it can be concluded that pioneering EdTech Leadership is important for ensuring better technological advancements and continuous improvement in the educational sector. The report has stated that the educators and their effective leadership is having an pivotal role in bringing technological advancements, enhancing the use of technology and developing the culture of innovation in the educational institutions. The report highlights that educators needs to be more flexible and should focus on using the student centric approach while paying attention over digital transformation of education. At the same time it is very important for the leaders to ensure that better support and training should be offered to the educators during the digital transformation.

Effective leadership can help in increasing the use of technology based practices and bringing innovation in educational sector. Distributed leadership and transformational leadership are the successful leaders which can really help in digital transformation and for increasing the use of innovative technologies in the educational sector. Along with these different leadership traits such as collaboration, teamwork, adaptability, data driven decision making, critical thinking, etc. are required by the leaders for using innovative technologies. It can be said that there is a symbiotic relationship between the use of innovative technologies and progressive leadership. It is necessary for the future leaders of the education sector to

understand that progressive leadership is required for revolutionize the modern education with the use of EduTech. It can be said that in the future of education sector technological advancement will retain expanding and due to this it will be necessary for all the leaders to emphasize over offering better support to all the stakeholders while adapting the changes.

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***Bridging Innovative Technologies, Progressive Educational Governance***

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# Chapter 8

## Developmental Supervisory Advancements: Refining the Art of Crafting Creative Approaches and Applications in Educational Leadership

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### ABSTRACT

*This chapter serves as an indispensable resource for educational leaders, offering a comprehensive exploration of developmental supervision's (DS) multifaceted impact in educational contexts. Rooted in a dynamic theoretical framework, it underscores developmental supervision's role in cultivating environments conducive to self-reflection, sustained learning, and pedagogical advancement. Drawing from psychology, education, and leadership studies, it exemplifies DS as a collaborative, data-driven practice significantly elevating teaching quality and student achievement. The chapter vividly illustrates the diverse applications of DS, spotlighting how observation, feedback, coaching, mentoring, and technology synergize to augment its efficacy. Robust empirical evidence reveals its substantial impact emphasizing advancements in teaching quality, student engagement, and academic achievement. By urging further empirical scrutiny and innovative strategies, the chapter positions DS as a cornerstone of educational leadership, underpinning the quest for comprehensive school improvement.*

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## **INTRODUCTION**

This chapter encapsulates the zenith of innovation in pedagogy, administrative stewardship, technological integration, and evaluative methodologies. It underscores the imperative for continuous evolution and refinement in leadership supervision. The chapter posits an ongoing endeavor to augment and refine the arsenal of techniques used in mentoring and governing educational leaders. As we delve into the heart of this chapter, we will explore the multifaceted nature of leadership in educational contexts, examining how new methods and technologies are reshaping the landscape of educational supervision. This exploration is not just about the introduction of new techniques, but also about the critical evaluation and adaptation of these methods to ensure they meet the evolving needs of educational institutions.

## **BACKGROUND**

Developmental supervision, which is distinct from traditional supervision methods, adopts a learner-centered approach in educational environments. This method prioritizes professional growth and reflective practices, focusing on enhancing teachers' skills and effectiveness through tailored and customized support. Emphasizing lifelong learning and development, it integrates techniques like coaching, mentoring, and specialized professional development programs (Zepeda, 2017). Supervisors within this framework adapt their behavior and relationship strategies based on the supervisee's experience level (Abdallah, 2023). This adaptation is key in facilitating the transformation of supervisees from novices to experts, equipped with strong problem-solving abilities and a deep, reflective understanding of their roles (Shodiya, 2005). The model, further refined by McNeill et al. (1985), categorizes supervisees into beginner, intermediate, and advanced levels to demonstrate their evolving competence and autonomy.

The enhancement of teaching quality, student engagement, and academic achievement is significantly influenced by developmental supervision. Its beneficial impacts in these areas are well-documented in research (Gallagher & Cottingham, 2019). This approach establishes a structured framework for continuous improvement, aiding in the identification of both strengths and areas needing growth, and in doing so, cultivates a culture of professional learning (DiPaola & Hoy, 2012). In the context of today's educational landscape, which requires adaptability to diverse learning needs, emerging technologies, and evolving curricula, the importance of developmental supervision is increasingly evident (Marzano & Toth, 2013).

## **THE MAIN FOCUS OF THE CHAPTER**

### **Key Principles of Developmental Supervision**

The approach of developmental supervision is grounded in principles that foster collaboration, ongoing support, and reflective practices (Barnett & O'Mahony, 2006). Four key principles aid supervisors and supervisees in effective engagement. These principles are being emotionally present, appreciating both vulnerability and competence, sharing knowledge with humility, and nurturing relationships that support professional growth over time (McMahon, 2014).

## **Benefits of Adopting Developmental Supervision**

Developmental supervision, as discussed by Donnelly and Brooks (2001), Benjamin and Penland (1995), Gordon (1990), and Bond and Holland (1994), is invaluable in various fields including nursing, health care, and education. It promotes professional growth, improves job performance and satisfaction, and enhances personal and professional development. Tailoring developmental supervision to an individual's developmental level, as highlighted by Gordon (1990) and Sonia (2022), proves particularly effective. It also plays a crucial role in enhancing professional competence (Stoltenberg, 2005). Adopting developmental supervision offers numerous benefits to educators, students, and educational institutions.

### **Professional Growth**

In its emphasis on professional growth and development, developmental supervision plays a pivotal role in enabling educators to improve their teaching skills and effectiveness (Gallagher & Cottingham, 2019). Stage models of supervisee and supervisor development, as presented by Hess (1986) and Žorga (2003), underscore the significance of context in this process. Specific models of developmental supervision are the focus of work by Gordon (1990) and Stoltenberg (2005), with discussions on Glickman's model and the Integrated Developmental Model, respectively. The practical applications of these models are supported empirically by Everett et al. (2011) and Sonia (2022), who demonstrate their use in field and educational quality supervision. The importance of professional development for supervisors is highlighted by Nasser (2020) and Yerushalmi (1993), with discussions on new model propositions and the potential impact of developmental problems in middle-aged supervisors.

### **Increased Job Performance and Satisfaction**

Educators who experience developmental supervision report higher job satisfaction and a greater sense of support and belonging within their educational communities (Bredeson, 2006). Benjamin and Penland (1995) and Pohan (2022) found that developmental supervision and performance management can increase job satisfaction. Research by Lee and del Carmen Montiel (2011) and Muhammad and Akhter (2010) suggests a positive correlation between mentoring, supervision, opportunities for promotion, and job satisfaction. Reflective supervision, as investigated by Frosch et al. (2018), also demonstrates a favorable impact on job satisfaction.

### **Improved Student Outcomes**

When teachers receive feedback and assistance, it directly impacts the quality of their teaching, leading to increased student engagement and improved academic performance (Musundire, 2015). Brown and Dinnel (1992) discovered that adopting a developmental approach can enhance students' progress and instructional techniques. Supporting this idea, Luiselli (2008) and Glanz et al. (2007) demonstrated that implementing a performance management intervention can elevate supervision levels, effectively associated with student achievement. However, Thies-Sprinthall (1984) and Randolph et al. (1995) emphasized the need for research and training in supervision within the context of student teaching.

## **Enhanced Teaching Practices**

Developmental supervision motivates educators to explore innovative and effective teaching strategies and methods (Bredeson, 2006). This collaborative, strengths-based approach supports teacher growth and enhances teaching practices (Stark et al., 2017). Its importance is especially evident in student development, where supervisors play a crucial role (Abiddin & Ismail, 2012). However, challenges in implementing developmental supervision, particularly in the clinical aspects of teacher preparation, remain (Kolman, 2018). Despite these challenges, the potential of developmental supervision in promoting teacher growth and enhancing teaching practices is clear (Reiman & Thies-Sprinthall, 1998).

## **Cultivation of a Learning Community**

Developmental supervision fosters a collaborative culture and shared learning within educational institutions, promoting collective responsibility for student success (Glanz & Zepeda, 2016). The cultivation of learning communities is vital for the success of developmental students (Malnarich, 2005). Characterized by self-organizing groups of learners, these communities are effective in supporting learning (Rosson & Carroll, 2006). By focusing on personal, interpersonal, and organizational capacity-building, these communities can be developed (Mitchell & Sackney, 2011). They are also beneficial in educational leadership preparation programs, fostering values-based leadership (Norris et al., 2002). The implementation of learning communities can enhance students' basic skills, self-confidence (Raftery, 2005), and literacy acquisition. Overall, learning communities positively impact students in developmental education (Weiss et al., 2015).

## **The Supervisor Prerequisites**

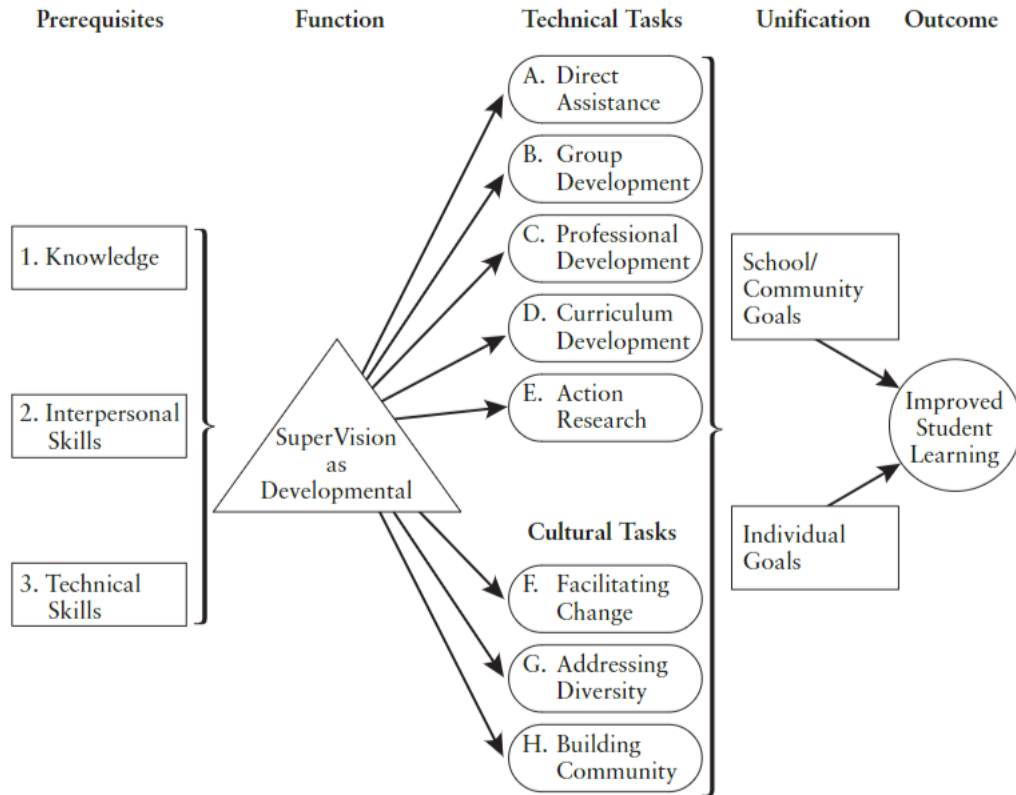
Supervisors in educational settings must meet specific qualifications, encompassing knowledge, interpersonal skills, and technical abilities (see Figure 1). The knowledge aspect requires supervisors to be well-versed in the teaching profession and educational context. This includes understanding both effective and ineffective schools and teaching practices, with a thorough grasp of curriculum and instruction (Glickman et al., 2013). The interpersonal skills component highlights the supervisor's ability to effectively interact with teachers and other school community members. Effective communication, listening, feedback, and support are essential (Alhabbash et al., 2021; Shodiya, 2005; Glickman et al., 2013). Building relationships and collaborating in curricula and procedural implementation are key focuses (Alsheikh et al., 2020). Technical skills involve planning and executing development activities that adhere to guidelines and address student needs (Glickman et al., 2013). This includes organizing training sessions, assessing their impact on teacher practice and student learning, and evaluating curricula and teaching methods. Supervisors must analyze student data, identify trends, and adjust curriculum and instruction accordingly.

## **Effective vs. Ineffective Supervisor**

Ladany et al. (2012) conducted a pivotal study exploring the dynamics of supervisory relationships, focusing on behaviors that foster clear feedback and a supportive learning environment (Alqodsi, 2023). These behaviors are crucial for achieving positive outcomes under supervision. The study also identi-

Figure 1. Basic guide to supervisions and instructional leadership

Note: Figure reproduced from Glickman et al. (2013).



fied ineffective supervisor behaviors, such as an overemphasis on evaluation and limitations, which can impair the relationship, leading to poor teacher understanding and treatment, and subsequently, negative outcomes in supervision. Interestingly, the research found no variations in these effective and ineffective behaviors based on the developmental levels of supervisees. This underscores the universal importance of cultivating a strong supervisory relationship as a foundational element of effective supervision. The study further investigates various aspects of supervisory relationships, including supervisor styles, self-disclosure, supervisee non-disclosure, and criteria for effective supervision. It underscores the necessity of establishing benchmarks for supervision competency and highlights the critical role of supervisor accountability. Additionally, this research emphasizes the importance of supervisors' dedication to training, their theoretical orientation, attentiveness to supervisees' needs, and competence in addressing multicultural issues. Ladany et al. (2012) provided comprehensive insights for enhancing supervisory practices and relationships.

### Need for Innovation in Supervision Practices

Traditional supervision methods in education, characterized by sporadic classroom observations and summative evaluations, often fail to address contemporary education's multifaceted challenges (Bredeson, 2006). These methods typically adopt a top-down, compliance-focused approach and do not provide

## ***Developmental Supervisory Advancements***

the consistent support necessary for educators' professional growth. In contrast, recent innovations in supervision, including the use of digital tools, peer coaching, and personalized development plans, align more closely with today's dynamic educational landscape (Glanz & Zepeda, 2016). These advancements offer real-time feedback, customized support, and data-driven insights, empowering educators to adapt, continually improve their instructional skills, and enhance student learning outcomes (Sarker et al., 2019).

Sterrett et al. (2020) emphasized the importance of collaborative interactions between teachers and administrators. Badavan (1994) highlighted innovative behaviors among primary school supervisors. The influence of technology on supervision has been a focus of Pan et al. (2021) and Hartley et al. (2016), with the former advocating for the informatization of supervision work and the latter proposing an apprenticeship model for behavior analysis supervision. Ismail et al. (2014) and Willcoxson (1994) discussed the role of strong relationships and clear, mutually agreed-upon goals in effective supervision, with the latter emphasizing the necessity of continuous training for supervisors. Both Harris (1977) and Noble and Irwin (2009) called for a transformation in supervision practices, with Harris advocating for preserving the fundamental supervisory root system, and Noble and Irwin advocating for a critical repositioning in social work supervision scholarship and practice.

As education continues to evolve, embracing innovative approaches to developmental supervision has become critical. These approaches equip educational leaders, supervisors, and line managers with necessary tools and strategies to effectively support and develop educators (Barnett & O'Mahony, 2006; Abdallah & Musah, 2023). Integrating these innovative practices bridges traditional supervision methods and contemporary education's evolving demands, which leads to improved teaching quality and greater student success (Darling-Hammond et al., 2017).

## **Peer Coaching and Mentoring Programs**

Peer coaching and mentoring programs, where educators collaborate to enhance each other's professional development, are vital tools in educational settings. These initiatives involve experienced educators (mentors) providing guidance, feedback, and coaching to fellow educators (mentees), creating a culture of trust and peer-to-peer learning (Basilio & Bueno, 2021). A prominent example is the Instructional Rounds program at Harvard Graduate School of Education, which involves collaborative observations and discussions to collectively improve teaching practices (City et al., 2010).

The effectiveness of peer coaching and mentoring in faculty development is well-established, especially for personalized feedback and interpersonal dynamics (Boillat & Elizov, 2014). Challenges such as potential lack of structure and coaching experience exist (Turner et al., 2018). Successful peer coaching relationships typically follow a three-step process: building relationships, creating success, and internalizing learning (Parker et al., 2008). Implementing a relational communication approach can improve peer coaching outcomes (Parker et al., 2015).

In health education, peer coaching positively affects teacher behaviors and student outcomes (Gingiss, 1993), while in clinical teaching, it enhances teaching skills and fosters collaboration (Flynn et al., 1994). High school implementations show improved teaching techniques and reduced feelings of isolation (Slater & Simmons, 2001). Peer coaching offers significant benefits for professional development, including opportunities for self-reflection and mutual growth in teaching practices (Yee, 2016). Ingersoll and Strong (2011) reported on the effectiveness of peer coaching programs in a large urban school district, noting increased teacher retention and improved instructional practices attributed to the collaborative nature of peer coaching.

## **Digital Platforms for Ongoing Feedback and Growth**

In the modern era, technology's unprecedented growth has transformed numerous aspects of daily life (Bataineh et al., 2022; Khalil et al., 2023; Rousmaniere & Renfro-Michel, 2016; Qablan et al., 2023; Qablan & Al-Qaderi, 2009). In educational supervision, integrating technology has been pivotal in enhancing supervisee performance. These advancements expedite supervisors' contributions and improve service quality (Rousmaniere & Renfro-Michel). One notable aspect of this transformation is the ability of digital platforms to streamline administrative tasks, allowing supervisors to focus more on mentoring and professional development. Furthermore, technology-enabled communication has enabled supervisors to connect with supervisees more efficiently, even in remote or asynchronous settings.

Central to this evolution are digital platforms, revolutionizing how educators receive feedback and support. Tools such as video observation platforms, learning management systems (LMS), and mobile applications are key in fostering communication and reflective practices (Sarker et al., 2019). For example, video observation platforms like Edthena enable educators to upload classroom videos for self-assessment or peer evaluation, a strategy increasingly adopted by various school districts to enhance teacher development. These platforms not only facilitate the sharing of teaching practices but also provide a structured way for educators to reflect on their own instructional methods and receive constructive feedback.

The significance of digital platforms extends beyond communication tools, as they sustain user engagement and promote participation (von Briel & Davidsson, 2019; Sokolov & Komarov, 2021). This increased engagement often results from the interactive features incorporated into many digital platforms, such as discussion boards, quizzes, and collaborative project spaces. Additionally, the convenience of accessing resources and materials through digital platforms has made them indispensable for educators and learners alike. As a result, these platforms have become integral components of modern education and foster an environment that encourages active participation and knowledge sharing.

However, designing and evaluating online feedback mechanisms poses unique challenges (Dellarocas, 2003). Ensuring that digital feedback systems are effective requires careful consideration of factors such as the quality and timeliness of feedback, the usability of the platform, and the alignment with educational objectives. Furthermore, evaluating the impact of digital feedback on educational outcomes necessitates robust research methods and data analysis techniques. Researchers and educators must collaborate to develop meaningful assessment strategies that capture the diverse ways in which digital feedback influences teaching and learning.

Empirical evidence of digital feedback platforms' effectiveness is provided by the Bill and Melinda Gates Foundation's Measures of Effective Teaching project. Teachers engaging with digital feedback showed notable improvements in teaching methodologies (Bill & Melinda Gates Foundation, 2009). This highlights the transformative role of digital feedback in educational settings and offers a pathway for continuous professional growth and development. The Gates Foundation's findings underscore the potential of digital platforms to enhance the quality of teaching and ultimately improve student outcomes, which makes them a valuable asset in modern education (Abdallah et al, 2023).

## **Action Research-Based Supervision**

Action research-based supervision is a dynamic method where educators actively participate in research projects aimed at enhancing their teaching practices. Under supervisors' guidance, this approach involves identifying challenges, gathering data, and making informed decisions to improve educational outcomes

## ***Developmental Supervisory Advancements***

(Koshy, 2009). Koshy's case study in a school district highlighted the positive impacts of such projects, particularly in areas like differentiated instruction, leading to significant advancements in instructional strategies and student learning outcomes.

Emphasizing collaboration and reflection, action research-based supervision fosters professional growth and student success (Glanz, 2005; Halim et al., 2010). Its flexibility supports both bottom-up and top-down implementation, effectively combining these approaches (Law, 2007). Mette and Starrett (2018) demonstrated its application in creating experiential laboratories for future administrators, while Stahlhut (1987) recommended it as a versatile supervisory strategy. Johnson (2011) recognized its utility for school administrators in addressing educational issues and assessing program efficacy. Darling-Hammond et al. (2017) conducted a study in a California school district that revealed that action research-based supervision significantly enhanced teaching practices and student achievement, both of which lead to increased empowerment and engagement in professional development.

## **Concise Professional Development and Microlearning**

Microlearning, characterized by delivering content in small, digestible units, offers a practical approach to professional development, especially for educators. This method facilitates quick and targeted learning, accommodating the demanding schedules of professionals and promoting continuous, just-in-time learning (Zhang & West, 2019). The utility and effectiveness of microlearning and bite-sized professional development have been explored in various industries. In the aerospace and healthcare sectors, mobile microlearning has been recognized for its flexibility and contribution to team cohesiveness (Hanshaw & Hanson, 2018). However, its application in enhancing teachers' instructional design skills has yielded mixed outcomes, with some educators expressing implementation concerns (Hanshaw & Hanson, 2019).

In the medical field, microlearning has shown potential in advancing learning objectives and knowledge acquisition, despite challenges such as pedagogical discomfort and technological disparities (Filipe et al., 2020; De Gagne et al., 2019). Betancur-Chicué and García-Valcárcel Muñoz-Repiso (2023) advocated for a tailored microlearning strategy aimed at developing teachers' digital competencies, specifically in feedback provision and decision-making. In a higher education case study, microlearning modules were implemented at a Sino-foreign institution, with a focus on classroom management and assessment. These modules significantly enhanced educator engagement and knowledge retention, which resulted in notable improvements in teaching practices (Wang et al., 2021). This study highlighted the effectiveness of microlearning in teachers' professional development and confirmed its role in elevating instructional quality across different educational domains.

## **Tools and Technologies to Enhance Developmental Supervision**

### **Video Observation and Analysis Software**

Video observation and analysis software enables educators and supervisors to record classroom sessions for subsequent analysis of teaching practices. These tools often include features for tagging moments of interest, adding comments, and sharing observations. Video allows for more precise feedback, as it enables supervisors and educators to revisit specific moments and behaviors, facilitating targeted coaching and improvement (Baecher et al., 2014). Moreover, educators can engage in self-reflection by reviewing their



teaching practices, thereby promoting autonomy in identifying areas for growth (Cleary et al., 2022). The convenience of video recording analysis reduces the need for simultaneous in-person observations.

## Learning Management Systems

**Learning Management Systems (LMS)** provide a centralized hub for managing educational content, assessments, and communication. They can include features for course organization, discussion forums, and progress tracking. Supervisors can access lesson plans, student data, and teaching materials in one location, a benefit that streamlines the preparation and review processes (Marzano & Toth, 2013). LMS systems often generate data on student performance and engagement, which informs supervision and professional development decisions. Additionally, these platforms can include feedback and discussion mechanisms that facilitate ongoing support (Abdallah & Alkaabi, 2023).

## Virtual Reality for Immersive Training Experiences

Virtual Reality (VR) technology offers educators immersive and interactive training experiences. VR allows for simulated classroom environments and scenarios where educators can practice and receive feedback. It creates a safe space for educators to experiment with new teaching strategies without impacting real students. VR simulations can replicate challenging classroom scenarios, enabling educators to develop skills and confidence. Additionally, VR systems can provide real-time feedback that allows for immediate adjustments (Chen, 2022).

## Artificial Intelligence-Driven Analytics for Identifying Areas of Improvement

Artificial Intelligence (AI) and machine learning algorithms can analyze large datasets to identify patterns and areas for improvement in teaching practices. These systems can assess teaching effectiveness based on various parameters. AI-driven analytics can quickly process enormous amounts of data, enabling supervisors to focus on specific improvement areas (Bill & Melinda Gates Foundation, 2013). AI provides objective insights based on empirical evidence, thereby reducing subjectivity in the supervision process. Furthermore, AI can offer personalized recommendations and resources for educators to address specific growth areas (Abdallah & Alkaabi, 2023).

## ISSUES, CONTROVERSIES, PROBLEMS

Holloway (1987) critically examined challenges and concerns in supervision model studies, highlighting the need to address the lack of long-term data. This shortfall hinders our understanding of individual development during training programs. The over-reliance on cross-sectional designs obscures insight into intra-individual changes over time, a critical aspect of supervision research. This study also critiques the prevalent use of structured self-report questionnaires and a heavy focus on quantitative changes. Such methodological approaches may introduce biases and restrict our understanding of various supervisory phenomena. Holloway (1987) suggested integrating open-ended techniques and direct observation for a more nuanced and accurate perspective of developmental supervision models.

## ***Developmental Supervisory Advancements***

Holloway also pointed out the pitfalls of employing questions centered solely on experience-level differences. This approach risks missing crucial transitional points, leading to skewed interpretations of developmental progression. Researchers are advised to be judicious in their timing of data collection and to consider the natural developmental trajectory to enhance the precision of supervision model studies. A key emphasis is placed on aligning research with established models in literature to effectively evaluate their validity. Testing the foundational structure of these models is pivotal in deepening our understanding of supervisory models (Jandiglu et al., 2023).

## **SOLUTIONS AND RECOMMENDATIONS**

To address Holloway's (1987) concerns regarding the study of supervision models, several strategies are recommended. Longitudinal studies tracking individuals throughout their training programs can mitigate the limitation of lacking long-term data and enrich our understanding of developmental changes over time. Shifting from structured self-report questionnaires and quantitative measures to open-ended techniques and direct observation is also advised to improve research methodologies. This shift aims to capture the complexities inherent in developmental supervision models more effectively (Darawsheh et al., 2023).

Researchers are encouraged to avoid overemphasizing differences among experience levels and to adopt a dynamic approach that acknowledges points of change during data collection periods. This approach is more conducive to drawing accurate conclusions regarding developmental progression. It is also imperative to align research with existing theoretical models to rigorously evaluate their validity. Testing the structures of these models is crucial in comprehensively understanding supervision models. Diversifying research methods and closely aligning research questions with theoretical models are key to overcoming the challenges posed by Holloway and advancing our knowledge of supervision models.

## **Overcoming Challenges While Implementing Developmental Supervision**

Implementing developmental supervision can face challenges, such as resistance to change. Educators or administrators accustomed to traditional supervision methods may hesitate to embrace new practices due to fear of the unknown (Darling-Hammond et al., 2017). Time constraints also pose a challenge, as educators often have schedules that make it difficult to find time for developmental supervision activities. Additionally, limited funding and resources can impede developmental supervision implementation, particularly when technology is involved or when additional personnel are required (Darling-Hammond et al., 2017).

Educators and administrators might hesitate to adopt developmental supervision due to unfamiliarity or doubts about its effectiveness. Conducting training sessions can provide an understanding of the advantages, easing uncertainties and instilling confidence in the approach (Alila et al., 2016). Resistance often arises when individuals feel excluded from the decision-making process. Engaging educators in the design and decision-making aspects of developmental supervision can minimize resistance. This inclusive approach ensures that their concerns and opinions are acknowledged and considered, which promotes a sense of ownership and dedication to the proposed changes (Marzano & Toth, 2013).

Gradual implementation of changes allows educators and administrators to adapt over time. Pilot programs or phased rollouts offer hands-on experience, which can make the transition smoother and reduce resistance (Barnett & O'Mahony, 2006). Moreover, emphasizing the long-term benefits of devel-

opmental supervision helps educators prioritize their professional growth and view it as an investment in their own development and their students' success (Gallagher & Cottingham, 2019). To enhance the long-term effectiveness of developmental supervision initiatives, seeking external funding through grants and establishing partnerships with external organizations or foundations is crucial, as suggested by Darling-Hammond et al. (2017). Additionally, maximizing resource utilization, as advocated by Basilio and Bueno (2021), often requires minimal additional funding. Exploring sources or cost-effective software and tools can optimize resources (Soriano et al., 2014).

## **FUTURE RESEARCH DIRECTIONS**

Looking ahead, developmental supervision in education is poised for advancements with several key emerging trends. Firstly, there is a growing emphasis on data-driven personalization, where advanced data analytics and artificial intelligence help supervisors create personalized development plans tailored to each educator's needs (Darling-Hammond et al., 2017). Additionally, the introduction of virtual and augmented reality (VR/AR) technologies is transforming learning experiences by offering teaching scenarios and real-time feedback through virtual classrooms (Martín Gutiérrez et al., 2017). Microlearning and mobile platforms are gaining traction as well, as they provide educators with professional development modules through mobile apps, which in turn promote continuous learning (Barnett & O'Mahony, 2006). Global collaboration is facilitating cultural mentoring opportunities and an exchange of innovative teaching practices worldwide (Duus & Cooray, 2014). Lastly, there is a shift towards an inclusion and equity focus within developmental supervision, which places increased importance on training supervisors in inclusive practices while addressing the specific needs of diverse student populations (Gallagher & Cottingham, 2019).

## **Encouraging Continuous Innovation and Adaptation**

To ensure the success of developmental supervision in education, actively embracing and driving innovation through key initiatives is essential. Initially, schools and districts should dedicate resources to research and evaluation to assess the impact of developmental supervision practices, including studying the effectiveness of technologies and techniques (U-Sayee & Adomako, 2021). Then, continuous professional development is crucial for educators and supervisors to stay abreast of emerging trends and technologies to adapt their practices to advancements (Marzano & Toth, 2013; Musah et al., 2023). Thirdly, fostering collaborative learning communities within schools and districts encourages sharing of experiences related to developmental supervision, which creates a culture of improvement (Boud & Lee, 2005). Lastly, agility in implementation is vital, with institutions demonstrating flexibility and adaptability in adjusting their approaches based on research findings and evolving practices (Bill & Melinda Gates Foundation, 2009).

## **CONCLUSION**

Developmental supervision represents a transition from traditional, compliance-focused approaches to a learner-centered model that prioritizes professional growth, collaboration, ongoing support, and reflec-

## ***Developmental Supervisory Advancements***

tive practice. This approach aims to enhance educators' skills and effectiveness, and it offers customized support to improve teaching methodologies and elevate student learning outcomes. It delineates the progressive stages of supervisee development, emphasizing identifying and maximizing growth opportunities. The impact of effective developmental supervision is significant in enhancing teaching quality, student engagement, and academic achievement. It promotes reflective inquiry and encourages educators to critically assess their teaching practices, set improvement goals, pursue continual professional growth, and foster a synergistic relationship between supervisors and educators—all with a focus on identifying strengths and areas for enhancement.

This chapter has delved into the dynamic nature of developmental supervision, underscoring its role in fostering an environment that promotes self-reflection, continuous learning, and professional growth. Using a mixed-methods approach, this chapter has amalgamated literature reviews, case studies, and surveys to furnish a comprehensive understanding of the multifaceted impacts of this approach in various educational contexts. The investigation has disclosed developmental supervision as a collaborative and data-informed practice, pivotal in enhancing pedagogical quality and significantly improving student achievement. Additionally, the chapter has explored the theoretical underpinnings of developmental supervision, drawing from diverse interdisciplinary fields such as psychology, education, and leadership. It has focused on elucidating core principles like autonomy, mastery, and purpose, which are fundamental to effective supervisory practices. Through a range of examples from different educational settings, the chapter has illustrated how supervisors employ strategies like observation, feedback, coaching, and mentoring to facilitate teachers' professional development. The chapter also acknowledges the critical role of technology in enhancing the effectiveness of developmental supervision and discusses strategic integration opportunities. The empirical evidence presented underscores the significant impact of developmental supervision, manifested in improved teaching quality, increased student engagement, and enhanced academic outcomes. Collectively, these findings highlight the transformative potential of developmental supervision in modern educational environments.

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***Developmental Supervisory Advancements***


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# Chapter 9

## DREAM Educational Management and Leadership: A Student- and Teacher-Centred Approach to Inspire Change and Growth

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### ABSTRACT

*This chapter describes the DREAM educational management and leadership approach, which the author has been implementing, researching, and developing for two decades. The DREAM acronym is based on ten principles inspired by teachers that ensure the educational teacher leader focuses on students and their learning by placing teachers at the heart of the institution. DREAM stands for develop, recruit, enhance, appraise, motivate and delegate, respect, enjoy, attend, and mentor. These ten principles are sequenced to provide a pathway of continuous teacher leadership development although they are all interdependent and practiced as a coherent whole. Each of the sections within the chapter is based on a principle and describes how it has been applied in a variety of contexts using feedback from previous course participants. The aim is to provide the reader with a series of short case studies of the DREAM approach in action.*

### INTRODUCTION

The DREAM Educational Management and Leadership model, developed to prioritize teaching, learning, and student welfare, involves teachers in leadership based on ten principles created by educators (Quirke & Allison, 2008). Enhanced over two decades through professional development courses, the DREAM approach fosters collaborative learning, aligning with the social constructivist nature of learning (Wink & Putney, 2002) and always considers student welfare (Atkinson & Claxton, 2003). This chapter gives insights into the DREAM approach and the transformational impact of professional development on participants, empowering them to apply and evolve the model.

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## **BACKGROUND**

The DREAM Educational Management and Leadership model, designed to enhance teaching and learning, is structured around ten principles: Develop, Recruit, Enhance, Appraise, Motivate and Delegate, Respect, Enjoy, Attend, and Mentor. Each principle aligns with leadership literature and contributes to a collaborative learning environment. The model emphasizes professional development, effective data use, and innovative assessment methods to improve teaching and student outcomes, drawing from various leadership theories. The DREAM approach involves teachers in decision-making and fosters continuous improvement, aligning with sustainable leadership concepts.

## **MAIN FOCUS OF THE CHAPTER**

### **Issues, Controversies, Problems: Transforming Teacher Leadership Practice**

As noted above, the DREAM approach and philosophy aims to bring students and their learning back to the centre of all decisions made at the institution by empowering the teachers and staff to involve their students as they are involved in the management and leadership of the institution. A key element of this approach is the consistent offering of DREAM professional courses to the teachers, staff and students, so this section describes in depth how the courses are run and the impact they have had over the past two decades, drawing on participant reflections and feedback.

There are eleven courses in total with an Introduction to DREAM Management and Leadership as well as a course around each of the principles. Each course has 12 units with an Introduction, ten units on content, and a Conclusion. Each unit is broken down into four stages based upon the author's work on teacher knowledge development (Quirke, 2009), which draws on social constructivist theories (Darling-Hammond, 2016; Maturana, 2012) that view knowledge as a collaborative process dependent on interaction with the community that constructs meaning from our experience and the earlier work of Tsui (2003) on teacher knowledge.

The first stage is Knowledge Seeker Preparation where the participants are required to read articles and view videos that introduce the principle and the underlying theories. This stage is where the participants begin to explore how this new information aligns or differs from their own understanding of themselves, their practice and their teaching and leading context, and they begin to theorize their practical knowledge and scaffold this new input to their existing knowledge schema.

The second stage is Knowledge Discusser as reflection and application of new knowledge is seldom complete without the involvement of others as we attempt to articulate how our developing understanding is compatible with the context in which we work. At this stage, the course provides participants with the possibility to discuss both asynchronously via a discussion board and synchronously via video conference sessions.

The third stage is Knowledge User as participants must apply the new principle in their workplace as they complete a task requiring them to lead a team using the unit's principle. This stage is crucial in the transformation of our knowledge structure as it is this practicalization of theory which confirms the applicability of the new knowledge to our teaching and leading context.

The final stage is Knowledge Provider Reflection, where the participants provide a referenced reflective narrative or discursive reflection on the impact of the unit and the task on their educational management and leadership beliefs and practice. The key to this stage is providing participants with choices in how they can submit their reflection, and the course allows them to use writing, audio and video formats individually or in pairs or small groups (Jandigulov et al,2023). This reporting element often strengthens the new knowledge structure and moves the new found beliefs and practice to the core of their professional selves.

This teacher knowledge developmental cycle provides a transformational framework, which is described in more depth in the next section, drawing on participant reflections and feedback.

## **SOLUTIONS AND RECOMMENDATIONS**

### **DREAM Educational Management and Leadership**

This section now aims to take the reader on a journey through the Introduction to DREAM Educational Management and Leadership course, drawing on the contributions and feedback of the participants of the last three courses in 2022, 2021 and 2020.

The first introductory unit takes participants through the structure of the course, the reflective assignments at the end of each unit and then breaks participants into groups to discuss a question on each of the ten principles. Participants are asked to introduce themselves to the group on the discussion board and reflect on their first impressions of DREAM and expectations of the course.

#### **Develop**

The second unit introduces participants to the strategic planning approach of DREAM with pre-readings on democratic leadership and an example of a StratPlan Day from one of my old colleges where everyone from driver to director participated in a guided development of the annual plan alongside student and community representatives. The day focused on collaborative goals and creative initiatives that could be launched in the coming twelve months. Feedback was taken from all participant groups and collated before being circulated for review and final publication. Regular follow up and clear communication throughout the year as the plan was implemented was prioritized, and the following year's StratPlan Day began with a review of the successes.

The synchronous discussion guides participants through the formulation of Ethos, Mission, Vision and then the strategic planning to take the team from mission to vision. The knowledge user task then requires participants to discuss with their teams their unit goals for the coming year and reflect on these and how they will follow up with the team as the year progresses.

One of the 2020 participants reflected on the experience of this task stating that "I strongly believe in working as a team. A team can bring together a variety of experiences and skillsets. I noticed the faculty was very enthusiastic and were sharing their ideas during the meeting." This inclusive approach to strategic planning is a critical element of the DREAM approach, and the Develop principle ensures this is highlighted from the beginning of the course.

## **Recruit**

This unit focuses not just on the recruitment of new faculty and staff to the department and institution but also the recruitment of faculty into teams and committees demonstrating that the underlying principles are the same. In other words, you recruit to the team balancing skills and knowledge with personal characteristics for team cohesion. The unit looks closely at structured interview techniques (Kimbrel, 2019) that determine future expectations on past performance as well as the characteristics displayed in the present during the interview or team formation process.

Both the synchronous and asynchronous discussions look at the full recruitment process from screening and interviewing to onboarding and integration into the team, and the task for the unit asks the participants to continue this discussion with their teams looking in particular at the best practice their faculty and staff have experienced in their careers.

Finally, the reflection requires participants to outline how they would plan the recruitment process for a new adjunct faculty position in their team targeting a specific need based on their annual goals. This reflection has been especially enlightening when two or three participants have discussed this in recorded video conference discussions. One such exchange presented the following summary of their discussion on how they would attract and interview potential candidates:

*“Reach more national and international candidates via a virtual tour (VR) to broadcast and engage via social media, and then interview using technology having viewed their performance in videoed presentations or lessons and read not only their CVs but also their research and portfolios.”*

This example demonstrates how the unit begins to stretch the participants and encourage them to think outside the box whilst empowering them to attempt new ways of approaching tasks that they may otherwise consider an institutional norm, which they must follow.

## **Enhance**

This unit introduces a new way of looking at professional development (PD) based on a teacher knowledge development model (Quirke, 2008) that the participants have already experienced as this DREAM course is structured in the same way. This experience appears to give participants confidence in discussing how they would adapt the model to best address both the individual and department needs with previous participants pointing out that traditional workshops could be seen as knowledge seeker and discussor examples, whereas action research may be considered knowledge user and provider approaches. Whilst not all agreed, the discussion allowed a wide ranging variety of professional development options to be raised in lively forums.

The task for the unit requires the participants to discuss the PD plan for the coming semester with their team using the same model, and then reflect on the outcome and how it may differ from previous PD plans they have run with their teams.

The reflections often went into some depth on how the approach taken had generated a refreshing teacher-centred variety of professional development offerings as exemplified by this one submission:

*“This approach ensures local ownership, which not only encourages more faculty involvement, it also rewards those who participate in ways far beyond what mere attendance ever could, both through the*



*process itself as well as the outcome, nurturing a creative initiate, instilling a sense of pride, facilitating cooperation, encouraging delegation and above all providing our faculty with the sense of belonging that comes from being part of something greater than themselves, something they believe in, something they love.”*

This example echoes the positivity many experienced from having taken a new approach to planning the professional development plan with their teams and requiring them to look at both their personal and team needs together in a new way. It is another exemplification of the transformational impact of the course on the daily practice of the participant leaders.

## **Appraise**

The preparatory reading for this unit is based on a portfolio based appraisal system (Quirke, 2015) that was developed with teachers and focuses on development rather than evaluation. The discussions that follow have often argued for how participants can take this approach with their team even if they are forced to use a more evaluative, quantitative, and summative institutional direction. By taking this formative, appraisal process with teachers, even when it must lead to a summative conclusion for the institution, it is posited that teachers feel more respected, involved and understood. This has been my experience throughout my career, and it is a cornerstone of DREAM Educational Management and Leadership, especially when explicitly linked to the Enhance principle for personal and professional development.

The knowledge user task requires participants to implement this approach to appraisal with a number of faculty volunteers from their teams and specifically discuss with them the following questions around each of the main stages of the system.

**Goal Setting:** Is there anything you want to specifically highlight from your goals this year? e.g. Classroom management or research publications.

**Observations:** How would you like to be observed (self/peer/supervisor/students/other?), and what would you like the observer to focus on?

**Student Faculty Evaluations:** How valid and reliable do you believe student faculty evaluations are, and how could we ensure they are more valid and reliable?

**Faculty Chair Meetings:** How can we use our meetings to demonstrate factors beyond our control to justify difficulty in meeting goals set (e.g. when a central directive prevents a goal being completed)?

**Overall thoughts:** What is your initial impression of this approach to your appraisal?

The participants are now given time to complete the reflection for this unit so that they can apply the approach over the semester, and this has resulted in a much greater reflective depth in the submissions as exemplified in this extract from a recent participant.

*“I am motivated to update the previously mentioned process into a monthly online performance tracker that can be completed by the employee and help the leadership visualize the progress before attending the final evaluation meeting. ... This tool will improve the validity of the evaluation tool and exclude any level of subjectivity.”*

## ***DREAM Educational Management and Leadership***

It is particularly interesting to note how the participant returned to the earlier discussions around using an appraisal approach within an evaluative system and found that that a further tool was needed to support the faculty and management bridge the gap between the formative portfolio construction and the institutional evaluative assessment. The example also demonstrates how participants' reflections move from an initial description of what they have done in the first couple of units to a deeper reflection that sees them expand and extend the input on the principles providing creative initiatives and new ways of leading their teams.

### **Motivate**

Motivate is the principle that brings all the other principles together and allows participants to reflect on the four previous principles whilst having a preview of the five principles yet to be covered in depth. The preparatory reading introduces participants to range of motivational theories and the discussions are framed around the main motivational aspect of each principle as follows:

The motivation of **inclusion** – **DEVELOP**

The basic motivation of **safety and security** – **RECRUIT**

The motivation of **personal advancement** – **ENHANCE**

The motivation of **purpose** – **APPRAISE**

The motivation of **responsibility** – **DELEGATE**

The motivation of **RESPECT**

The motivation of **happiness** – **ENJOY**

The motivation of **recognition** – **ATTEND**

The motivation of **teamwork** - **MENTOR**

The discussions focus on the individual motivations of the participants asking them to discuss in smaller break out groups what motivates them and which are their most important motivators. These breakout sessions continue on the asynchronous discussion board and are guided by the following questions:

How can we include others in our day to day work?

Why are safety and security so essential to motivation?

What is the most motivating PD you have experienced?

How can appraisal motivate?

When have you been given responsibility that has motivated you?

How do RESPECT and ENJOY motivate you?

When was the last time you felt motivated when someone praised?

What is the most motivating team you have worked with?

The knowledge user task then requires the participants to have the same discussion with their teams, find out what motivates them and continue to contribute to the discussion board by posting their team's motivations and what surprised them.

Finally, participants are asked to reflect on how they motivate their teams and what they would now change given the responses they have received to the questions and discussions they have had with their teams. These reflections have often been very illuminating with, for example, one recent participant

focusing on how they found the appraisal approach very motivating for their team and how each stage of the appraisal from goal setting to the final meetings with the Chair had a different motivational aspect. Another participant began the reflection with this extract:

*“From my perspective there are so many aspects that go into developing motivation and many layers of motivation itself. I think that most people could separate out motivation as having 2 realms personal and professional. And, that we need to consider levels of motivation change as situations change. ... Based on the assigned task I have asked my colleagues what motivates them and through my data collection I also decided to ask what demotivates them as I found the responses to be a mixed bag.”*

The participant then went on to draw from a range of literature to analyze the responses of her team, noting in both personal and professional terms what they had gained from this process. The reflection was a very good example of how the unit’s work can impact participants profoundly and potentially transform their leadership approach.

## **Delegate**

The preparatory readings look at delegation as an art and a science with five short papers including one on distributed leadership and another on situational leadership. The discussion sessions then take participants on a journey through delegation asking them what to delegate, when to delegate, who to delegate to and how to delegate before considering why they should delegate.

The task then requires participants to keep a record of everything they delegate during a week adding who they delegated to as well as how they delegated the task and why they delegated this task in that way. They are also asked to track what they did not delegate and why.

The final reflection asks them to review how successful their week of delegation was and if they would do anything differently based on this experience. One recent participant wrote at the beginning of their reflection:

*“Before this course, if I were asked about delegating at work, I certainly would have answered that I was a much happier person simply getting my work done, and that while at times this meant that I was over-tasked and quite stressed, it also meant that I could control what was happening and how it was getting done.”*

They then described in some detail what they had delegated during the week based on the task set and concluded the reflection with this transformation:

*“I can see the value and the ease that it does bring into life, and definitely believe that it is something that I can continue to work on to help develop myself both professionally and personally.”*

As teachers, we have grown professionally to rely on ourselves as the leaders of our classes behind closed doors, and this makes us generally very poor delegators, so that when we move into management and leadership roles, it is delegation that is often the skill we most struggle with. This unit has consistently managed to present delegation as an essential part of our managerial and leadership toolkit and transform participant practice.

## **Respect**

Respect is the first of what we call the two intangible principles with Enjoy being the second. Respect is crucial in leadership as it is in all aspects of life and work yet we very seldom explicitly discuss or address respect until we are faced with conflict. Therefore, the four short preparatory readings are used simply to ensure participants consider when they feel respected, when they feel disrespected and how they show respect to others at work.

This, then, allows the discussions to focus on these three questions before they tackle the task which requires them to consciously note throughout a week how they show respect to their team, other faculty, managerial colleagues, staff, contract staff (e.g. the security, cleaners etc.) and senior leadership.

Finally, they are asked to submit a reflection on how they managed to cover the following demonstrations of respect presented during the discussions:

- Know your students and colleagues.
- Understand your students and colleagues.
- Respect your students and colleagues.
- Involve your students and colleagues.
- Give your students and colleagues choices.
- Consult your students and colleagues.
- Rely on your students and colleagues' input.
- Value and reward your students and colleagues' input.

This guided reflection structure has been a powerful trigger for some very deep reflective submissions, which have often been very personal and powerful. One of the advantages we have in working in a multi-cultural environment with many different nationalities in our teams is that the discussions on respect often highlight differences in what we consider disrespectful, and it allows the conversations to enlighten us as we realize much workplace conflict is a result of misunderstandings with one party feeling disrespected when no disrespect was intended. This awareness can result in some transformational approaches at work as one participant related when summarizing their learning in the institution over twenty years.

*“In an environment like ours where people come from different backgrounds and cultures showing respect is a necessity to build healthy relationships and develop a strong organizational culture, because respect will make people ignore the differences in others and focus only on their relationship with that person. ... Respect is a simple act with a powerful reaction. There is saying which I keep memorizing and reminding myself of: “Treat others the way you want to be treated.”*

This short extract is from a long three-page reflection, but it gives a glimpse of the personal depth of reflective writing that this rare, explicitly focused discussion on respect almost always generates.

## **Enjoy**

I often introduce this unit by saying that ENJOY is the centre of DREAM and my favourite principle. The underlying motto for the principle is that we enjoy coming to work alongside our team and dem-

onstrate this constantly. The ENJOY principle is therefore about creating a positive work environment. In today's business and education world, we are surrounded by 'Happiness Centres' and a range of key performance indicators (KPIs), which have happiness as their focus. However, we cannot make someone happy. Happiness is an internal characteristic and controlled by the individual. You cannot force happiness (Spicer & Cederström, 2015). What we can do is create a positive environment that is conducive to a better learning and teaching environment. We can exude positivity, and thereby give our faculty and staff more opportunities to feel happy at work. The preparatory readings address this difference between happiness and positivity, and the discussions focus on how this distinction can impact how we create a more positive teaching and learning environment for our team (Abdallah & Alkhrabsheh, 2019).

The knowledge user task requires participants to consciously record how they demonstrate the ENJOY principle around their department and throughout the institution for a week, and then they submit their reflection on what differences their expressions of ENJOY made to the week at work and among their team. They are also required to include at least one reference of an article that best describes how important ENJOY is to them and their management and leadership style.

Reading the reflective submissions often brings me a lot of joy and happiness, and they brighten up my day and help me create more positivity around me. My favourite, recent submission is below, and I hope it brings you that same feeling.

*“What I enjoy the most at work is talking to students as they bring so much joy, and they lighten up my day. A couple of weeks ago a group of students visited my office to enquire about summer and fall courses, and while chatting away we drifted from one topic to another until we ended up talking about dreams and future plans. Then, one of them told me that he might be a singer, because he has a nice voice, so I dared him to sing for us, and the surprise was that he didn't have a nice voice at all, and we all had a great laugh. That was total enjoyment. Just enjoying the simple things in life that can bring happiness into our lives and lighten up our day.”*

This extract was fronted and followed by a reflection on how the unit task made little expressions of ENJOY, that were done largely subconsciously, more explicit and made the participant more aware of how important the little details are and the impact they make on so many colleagues across the institution. As the old saying goes, a smile goes a long, long way.

## **Attend**

The ATTEND principle is the most managerial of the ten principles, and it is introduced with its motto of 'Never ask someone to do something you are not prepared to do yourself'. So, if you are asking your team to do a late shift until 10pm, then you, as the leader, must be available at least once a week alongside them. It is a simple motto, but a difficult one to follow consistently.

The preparatory readings and viewings are a series of short extracts from a range of sources, which serve to introduce the participants to the agenda for the discussions. The agenda includes Management by Walking around (MBWA), managing time by effective use of calendar features, an approach to survive email overload, email etiquette for communication with clarity and care, and how we can best share, support and understand one another.

The knowledge user task then asks the participants to practice the principle throughout the coming week by:

## **DREAM Educational Management and Leadership**

Walking around and talking to everyone,  
Using your Calendar features very day,  
Deleting your Inbox to zero by the end of the week,  
Sending emails of only one sentence,  
Smiling,  
Asking questions, and  
Helping someone at least once every day.

In other words, by following the ATTEND principle we ensure we lead by example.

The final reflection asks participants to describe their experience of the week and how they managed to complete, or not, each of the ATTEND actions and the difference doing these made to their working week. These reflections tended to be some of the longest in the course as participants wrote detailed paragraphs on each of the seven actions, and the example below illustrates this with one paragraph on using the calendar features.

*“Most work clashes, hard feelings towards others and misunderstandings can be avoided if we develop a culture of showing consideration to each other. Among the many wonderful things I have learned ... is the brilliant practice of using the outlook calendar as a reminder to reply to emails, complete tasks, follow-up, call someone back or even to drop by someone’s office for a quick chat. ... These little notes are not just reminders. They are a commitment to attend to someone because he/she is important. ... In my opinion respect, enjoy and attend complement each other ... these qualities are the foundation to build healthy and strong connections with others professionally and socially.”*

As with the reflective tasks in other units, the example provides a good indication of the transformational impact the application of the principles can have on not only the participant’s management and leadership approach but also on the environment of the department and institution where they work.

## **Mentor**

The final principle covered in the course looks at how building mentorship relationships among the team can generate a positive teaching and learning environment, and the readings and discussions focus on how these can be structured and set up whilst ensuring that no relationship is forced. An effective mentoring relationship can only be generated when both the mentee and the mentor enter into the relationship willingly and understand the positive impact the experience can have on both.

Numerous examples are discussed from teaching mentorships to research mentorships and even ‘buddy’ mentorships to help new faculty and staff settle into a new working environment. As the unit falls at the end of the course, the task and reflection ask the participants to select one person they would like to mentor in the coming year, why they have chosen them and what the focus of the mentorship would be as well as the expected outcomes. They are also asked to choose one person they would like to be mentored by, answering the same questions. The example below is a typical extract introducing a long description of how they would like the mentorship to be structured and the learning expectations they would expect from the mentorship.

*“I would like to be mentored by the Dean of Academic Operations. As a program team leader, I am interested in learning more about the inner workings of the academic system and how decisions are made*

*at a higher level. I believe that being mentored by the Dean will provide me with valuable insights and perspectives that will help me improve my own leadership skills.”*

By finishing on a reflection that looks forward to the coming year, the course aims to ensure that the DREAM experience is continued and will continue to impact the participants’ reflective practice long after the course itself is completed.

The final conclusion unit reviews the principles and gives participants space and time to reflect on the course and its impact as they complete a structured review and feedback document. By ensuring that the final reflection is the course feedback, the participants can see in the coming year how the course has changed thanks to their input. So, they see their voices have been heard, they feel empowered and the course itself is strengthened as it is continuously updated.

## **FUTURE RESEARCH DIRECTIONS**

This continuous research of the DREAM Educational Management and Leadership course and approach ensures that the model is always changing and evolving with the latest insights from the field and is, therefore, sustainable. DREAM, in this way continuously models sustainable leadership (Hargreaves & Fink, 2006) and looks to the future.

The next development for the course is a steady move towards making the course more accessible by transforming the content into a fully online medium. Most feedback from participants has commented on the importance of the synchronous discussions, and the author’s research is currently focused on how these synchronous elements could be included in a fully online version effectively.

The model, I hope, will continue to evolve with the research and new trends in management and leadership as research takes us in new and unexpected directions. The key is to always keep the students, and those closest to them, the teachers, at the heart of the approach. That is now the DREAM will continue.

## **CONCLUSION**

This chapter has achieved its objective if you, the reader, have gained a clear overview of the DREAM professional development programme, and felt the impact it has had on the participant managers and leaders who have attended the course. The application of the DREAM approach empowers teachers, creates a culture of continuous improvement, improves retention and builds a supportive community. It is an impactful and transformational series of courses that requires practitioners to question and reflect on their managerial priorities and leadership styles. We hope you will continue to explore DREAM and the leadership literature that drives the model and its humanistic and empathetic focus on students and teachers. It is this that truly creates a creative and inspiring learning environment.

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## **KEY TERMS AND DEFINITIONS**

**Adaptive Leadership:** A model introduced by Heifetz (2009) which aims to mobilize teams to handle non-technical problems using emotional intelligence, organizational justice, development and character.

**Authentic Leadership:** A style that emphasizes transparency, genuineness and honesty to inspire trust and a positive working environment.

**Democratic Leadership:** A style that actively involves staff in participative management seeking feedback and inviting input.

**Distributed Leadership:** An approach that focuses on shared management with decision making dispersed to collaborative groups.

**Ethical Leadership:** An approach that requires the active demonstration of thoughtful conduct respecting the beliefs, dignity and values of others.

**Learning-Centred Leadership:** An approach that requires the leader to be a role model, who is interested in teaching and learning, and keep in touch with what is happening in the classrooms.

**Servant Leadership:** An approach that prioritizes serving the greater good putting the team and organization first.

**Situational Leadership:** A theory developed by Hersey and Blanchard (1988) that requires adaptability and the application of the leadership style that is most appropriate for a given situation and team.

**Transformational Leadership:** An approach that generates valuable and positive change, supporting teams to develop within and to changing social systems.

**Values-Based Leadership:** A style and philosophy based on shared common beliefs generated with the team to strive for enhanced development.

# Chapter 10

## Modern Leaders, Revolutionary Results: Steering Transformation in Today's World

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### **ABSTRACT**

*In every field, innovation remains pivotal, especially in the realm of education where it consistently refines the teaching and learning experience. This chapter delves into the profound influence and significance of innovation in reshaping educational facets. Emphasis is placed on the transformative leadership in education and its alignment with progressive and inventive cultures. The discourse highlights the capability of transformational leadership to foster professional growth and a spirit of teamwork. Evidence suggests that both educators and students thrive under transformational leadership, benefiting from its capacity to motivate, and instigate positive change. The chapter underscores the value of continuous learning and professional enhancement for transformational leaders, as it cultivates an enduring learning ethos, crucial for professional evolution. Furthermore, this chapter presents tactics that transformational leaders might employ to stimulate progress in the educational sector.*

### **INTRODUCTION**

Leadership refers to managerial decision making (Jandigulov et al., 2023). In education sector, the concept of transformational leadership is used in terms of leading through example. It inspires as well as nurtures future leaders to bring significant yet positive changes in individual and social systems. For example, a transformational school leader ensures that students not only reach their academic achievements but also to improve their learning journey. Similarly, transformational leader inspires the teachers and staff members to pursue as future leaders or role models for the purpose

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### ***Modern Leaders, Revolutionary Results***

of facilitating improvements and innovations in education sector as education is now regarded as a strategically significant component of life (Abdallah & Alkhrabsheh, 2019). Teachers are able to learn and acquire new skills and knowledge (Abdallah, & Farhan, 2023). The main purpose of implementing transformational leadership in education is to do better for each student; hence this mindset creates as well as fosters innovation and creativity aspects in the schools and universities. With time, transformational school leaders adapt and innovate into new things that often leads to cultural shifts and updated technologies (Al Harbi, Alarifi & Mosbah, 2019).

Education sharpens the talent factor in individuals; hence transformational leaders always ensure to maintain continuous improvement and changes in the pedagogical aspects. Traditionally education leaders simply ask the employees to complete the assigned duties with expected compliance; however, focusing on transformational leadership inspires the leaders and principals to push the teachers and other educators towards innovation and creativity (Al-Husseini, El Beltagi & Moizer, 2021). On the other hand, transformational leaders assist school teachers and educators by helping them transcend their self-interests and self-centered values. Therefore, it helps the teachers to receive support from leaders which further builds vision for school's future. The success of school is dependent on both student's academic excellence and teacher's professional growth; hence, transformational leadership plays crucial role in facilitating development in educational settings. In addition, like all sectors worldwide, the educational and academic domains are impacted by unforeseen crises. Yet, the nature and characteristics of these crises can vary. (Darawsheh et al, 2023).

In the present chapter, the study describes the importance of transformational leadership in education sector and how it helps the leaders to embrace change and growth in educational areas. The need of innovation is also stated in the present chapter as that drives positive change in diversified educational areas specially as the UAE is home to more than 200 nationalities and the schools currently teach 16 different types of curricula (Abdallah & Alkaabi, 2023). Furthermore, the chapter examines the role of technology in leveraging innovative aspects in education. This pinpoints the fact that the use of technology is important for both teachers and students (Abdallah et al., 2023). Regarding this, the chapter also discusses the role of technological innovation in addressing potential challenges and considerations in educational setting. Moreover, the chapter demonstrates the significance of continuous learning and professional development for transformational leaders; hence, some strategies are discussed that promotes innovation and professional learning for leaders. Lastly, the chapter outlines how transformational leaders inspire change and promote growth in educational institutions through the power of innovation (Abdallah et al, 2023).

In UAE, educational sector has been greatly emphasizing on the change and improvement aspects; hence, the scope of transformational leadership is emerging greatly. Leaders not only focus on adopting new leading styles but also, they ensure that the styles have a lasting impact on school development and improvement areas. In UAE, the (MoE) Ministry of Education in conjunction with (KHDA) Knowledge and Human Development Authority focuses on embracing innovative practices that can inspire and foster growth in educational area.

This helps the leaders as well as the educators to leverage technological advancement in the process of learning as well as administrative management which improves the functioning of the institution respectively (AlQodsi & Aljahoori, 2023)

## **VARIOUS DIMENSIONS OF INNOVATION IN TRANSFORMATIONAL LEADERSHIP**

### **Dimensions of Innovation in Transformational Leadership**

In the domain of education, it is essential for the leaders to share the vision so that the teachers and associated educators can help in meeting the goals. Since, transformational leaders focus on continuous development and improvement; therefore, their focus remains on facilitating innovations and creativity at the education institutions. In order to embrace innovation in the work culture, it is vital for the leaders to emphasize on sharing the vision with the teachers and educators for the purpose of making education better and improved. For example, the UAE's leader Sheikh Mohamed bin Zayed extends not only his support for education but also, he established vision and creative ideas to empower educational standards in the country. This includes monitoring and conducting field visits, launching different initiatives as well as rewarding students for outstanding performances (Arabian Business, 2022).

Therefore, for a leader it is essential to focus on visionary thinking not only to help students excel in their learning journey but also to assist teachers in their professional growth (Abdallah, & Musah, 2023). A transformational leader inspires the teachers and educators to embrace innovation through coming up with new ideas of teaching and learning which helps the students to improve their learning journey in positive manner. According to Ataboyev & Tursunovich, (2023), visionary thinking directs the leaders as well as followers to prepare effective strategies and techniques to reach the goals. Also, it is believed that vision gives a sense of purpose and guides throughout the journey; hence, it articulates what the education institution aspires to accomplish. To facilitate innovations, visionary leaders inspire followers to work for the future goals wherein they also focus on direct and effective communication. Since, education is one of the greatest platforms that builds talent; hence sharing vision helps the institutes and associated leaders to address a fast-changing world (Novitasari et al., 2021).

Innovation is a complex process; hence, it is apparently embedded with several risks; however, a transformational leader must inspire the educators to develop risk-taking capacity even when the outcomes are uncertain. This is essential for the purpose of professional growth and learning wherein transformational leaders ensure that educators and other associated people are growing in the respective domains. For instance, in UAE, MOE develops an Innovative Education System for a knowledge and global competitive society which prepares all age group people to meet the labor market needs (UAE Ministry of Education, 2023). At the same time, it also ensures to maintain quality, efficiency and good governance of educational institution's performance. Transformational leaders in education inspire and direct the teachers to take time to research and evaluate new things so that the quality of teaching and learning can be improved for the students. Similarly, they also focus on taking appropriate risks if that happens to impact the institution in any way. Also, transformational leaders motivate teachers not only to take risks but also to learn from every failure in terms of assisting them towards real growth (Alsaai, 2014).

The focus of a transformational leader is on fostering a culture of creativity wherein not only teachers, but students also become creative through attending different workshops and seminars. Baruah & Paulus, (2019) in this respect says that transformational leaders should empower the teachers and students to share their ideas without fear as it boosts their morale and drives productivity factor. For example, a culture of creativity in educational institution develops new and unique ideas and that is when new

### ***Modern Leaders, Revolutionary Results***

solutions and processes begin. In addition to this, autonomous environment helps teachers to specify their requirements for better teaching and eventually, it improves the standard and quality of education (Shields & Hesbol, 2020). It has been observed that creative culture encourages group work and team building aspects wherein both teachers and students can learn ways to socialize positively with others. This is also essential for facilitating brainstorming activities wherein students as well as teachers can share their ideas and learn new ones. In support to this, Halász, (2021) says that creative culture enhances social skills; hence, it creates better learning environment in the education institution. Teamwork is an essential aspect in transformational leadership which also greatly contributes to facilitate innovation and it also motivates teachers and educators to transform the work culture in a positive way (Abdallah & Alriyami, 2022).

In transformational leadership, leaders empower the followers to take ownership of their professional growth in which they provide them the autonomous yet professional environment wherein faculty, coaches and students can perform better and innovate in the classroom. Focusing on own professional growth gives apt idea about the areas of improvement and development; hence, this aids the educators to build their career and professional dynamics (Khan & Khan, 2019). Among the major attributes of transformational leaders, empowering others is the one in which leader ensures to focus on the growth of followers by organizing training as well as development opportunities for them. There are several other dimensions such as idealized influence, inspirational motivation and intellectual stimulation included in transformational leadership which contributes to improve productivity and efficiency of people and leads to a knowledge-based economy. In the views of Kim & Park, (2020), it helps in managing and developing intellectual capital within the education system which is inevitable aspect of transformational leadership.

## **ROLE OF TECHNOLOGY IN FACILITATING INNOVATION IN EDUCATION**

### **How Technological Advancements Helps Educational Institution**

Technology is a powerful tool which transforms the process of learning as well as teaching as it helps affirm and reinvent new approaches to meet the needs of people. Educators are the collaborators in learning wherein they should seek new knowledge as well as constantly acquire new skills along with students to improve the quality of teaching (Kwan, 2020). Therefore, in this respect transformational leaders set a vision for creating learning experiences wherein they provide the right tools and supports to both teachers and students to thrive. Technology has changed the education pattern since Covid-19 and afterwards, it became a vital part of both and learning process. Technology has been greatly integrated into education curricula which further helps teachers to harness online learning as the most powerful educational tool. As per the study of Kraus et al., (2021), it is identified that the effective use of digital learning tools in classrooms not only amends student's engagement but also it helps the teachers to improve their lesson plan and facilitate personalized learning. Moreover, it assists the students to develop essential skills required in 21<sup>st</sup> century (Alqodsi et al, 2023).

Technology has facilitated innovations in the education sector such as it has introduced virtual classrooms, video, robots and augmented reality tools which makes the classroom livelier and creates inclusive learning environment for all students. It also fosters collaboration and inquisitiveness which enables the educators to collect and maintain appropriate data about student's performance (Badawy & Alkaabi, 2023). With the help of technology, teachers come up with innovative teaching strategies that leads to

clearer as well as better communication with the students. From the study of UAE fintech (2022), it has been identified that the education technology (EdTech) market is worth \$244 billion worldwide and after 2020 the usage of EdTech is increased to 99% in education institutions. In UAE, EdTech is gaining traction as it gives access to digital technological tools such as Artificial intelligence, virtual reality, blockchain and sensor based IoT which improves learning and teaching processes (Musah et al.,2023).

All these advanced solutions are being integrated in UAE's core education setting which widens the scope for students and educators to learn in their own time and ways. In UAE, 72% of the educational institutions have advanced their digital initiative roadmaps to help prepare effective curriculum for the students. Furthermore, technology has also transformed the traditional roles of both teachers and learners, whereas in past times teachers were simply considered a vehicle for delivering information. However, today teachers are turning more into the guidance roles as facilitators. Because of technological integration, students are becoming more accountable for their own learning through virtual learning environments (Le & Lei, 2019). In UAE, technology is positively transforming education aspects that helps the teachers to create as well as share materials in novel formats. This also creates collaboration with students; hence, develops ways to work with learners without any accessibility issues. In addition to this, UAE is also embracing education with diversified platforms such as Learn Live UAE wherein the leaders and educators from UAE can come and share their ideas and best practices about teaching and learning (UAE fintech, 2022). This aims to support students and their academic needs in different ways (Abdallah et al, 2023)

From past several years, the UAE has been strongly focused on technology in education; hence, it initiated an Innovation Hub by Oracle in Dubai which ensures that students can develop technological breakthroughs. Technology plays a vital role for students to collect valuable and reliable content and implement practically (Abdallah, Aljuburi, & AlKhasawneh, 2023). This makes the education institutions move from papers, books and pencils to electronic sources (Malek, 2018). In UAE schools, there is a huge scope for smart classrooms and digital screens as that increases students' involvement in classroom activities and helps in sharpening their analytical skills (Darawsheh et al, 2023).

## **SIGNIFICANCE OF CONTINUOUS LEARNING AND PROFESSIONAL DEVELOPMENT FOR TRANSFORMATIONAL LEADERS**

Apparently, focusing on continuous learning and develops helps the leaders to enhance as well as sharpen their leadership skills and it also unlock leadership brilliance. The study of Novitasari et al., (2021) says that continuous learning is a self-motivated persistence which helps in acquiring knowledge and competencies and expands skill sets; hence, it plays significant role in climbing the ladder of professional success. With the rapidly changing education scenario, the role of leaders has become more challenging than before and in order to fill the skill gap, focus remains on learning and professional aspects. For a transformational leader, it is essential to emphasize on learning new things not only to stay updated but also to implement new things and improvement continuously to develop the quality of education. For example, professional development activities keep the leaders updated about new approaches and strategies that further facilitate innovation in the education industry (Stéphan et al., 2019).

On the other hand, modern learners must emphasize on expanding their skills and effectiveness because that improves their decision-making and problem-solving skills. There is a direct connection between teacher leadership and school effectiveness as when teachers deliver quality educational services to the

### ***Modern Leaders, Revolutionary Results***

students it eventually improves overall school's academic aspects (Abdallah, 2023). It is certainly true that often leaders must make several decisions in uncertain situations; therefore, focusing on continuous learning and development helps assist them in making informed and strategic decisions. Supporting to this, Shields & Hesbol, (2020) contends that leaders engaged in continuous learning are more likely to foresee and respond to challenging situations and this also allows them to see things from different viewpoints; henceforth, it promotes long-term success. Equipping with continuous learning also assist the leaders to adapt to changing conditions wherein leaders can predict about future trends and can make necessary updates accordingly. However, a culture of learning makes a leader role model wherein new opportunity are embraced for other people also to improve as well as grow in professional areas (Alqodsi,, 2023). A leader focusing on professional development aspects inspires the staff, teachers and students towards continuous learning and development (Stéphan et al., 2019). Also, to a greater extent, people learn to accept and implement changes.

A transformational leader focuses on three attainable goals such as opportunities, control and support; hence, continuous learning develops space for leaders to achieve these objectives respectively. There are various strategies through which transformational leaders can promote innovation such as they connect with professional learning communities wherein, they learn about implementing new techniques that makes the education process improved, interested and comprehensive (Susilawati, Khaira & Pratama, 2021). Also, learning inspires education leaders to involve the teachers and educators in professional development aspects so that the quality of teaching can be improved along with institution's overall performance aspects. Apparently, a leader can inspire the followers through own actions; hence, this creates a culture of learning and creativity in the education institution. Van der Rijst, Baggen & Sjoer, (2019) contends that transformational leader ensures to allocate resources for the professional development of teachers and staff members in terms of embracing lifelong culture in the education institution. Professional development not only develops the professional skills; but also, it assists in sharpening social skills which is another way of facilitating creativity in the work aspects (Abdallah & Abdallah, 2023).

Under professional development activities, transformational leader focuses on leveraging collaboration with external partnerships for the purpose of building expertise and support so that right services can be delivered. In the same way, education leaders also collaborate with external educators and professionals to improve the quality of educational services (Baruah & Paulus, 2019). This is yet another technique of inspiring the team to learn and grow both from personal and professional dynamics. In UAE, in-service professional development is extremely important not only to retain quality teachers but also to keep their knowledge and skills up to date. Therefore, professional development takes place in a lot of forms such as mentoring, workshops and connecting leaders to experts. In UAE, teachers come from varied national backgrounds; hence, it is essential for them to participate in 30 hours of professional development wherein Abu Dhabi Education Council and Ministry of Education runs programs that offers different training sessions (UAE Ministry of Education, 2023).

In an era of constant change and improvement, education leaders are required to stay ahead to better manage the organization's dynamics in terms of remaining competitive. Leaders are known to lead by example; hence, they must be open to changes and must prepare themselves to quickly respond to the changing circumstances; therefore, this defines the importance of professional development for leaders (Ataboyev & Tursunovich, 2023). Since, growth is the key to success; hence, professional learning assists the transformational leaders to inspire the team to come up with new ideas and opinions to enhance the overall quality of educational services. It has been observed that



continuous learning assists the leaders to improve their communication skills and it also aids them to comprehend teacher's and student's learning needs. In the study of Wei, Liu & Sha, (2019), it is ascertained that leaders who are well-versed in interpersonal communication understands the team's concerns effectively and addresses the potential challenge more quickly and effectively. In addition to this, continuous learning also allows the leaders to build relationships with teachers and students which further helps in discovering new career opportunities.

## **CONCLUSION AND RECOMMENDATION**

Transformational leadership is based on motivating as well as inspiring people since proactive leadership style aims to deliver continuous change and improvements in all aspects. It is renowned that transformational leaders encourage and inspire to drive innovation and create improvements in the work aspects. Hence, under transformational leadership employees become creative and good problem solvers and they can also be trusted for autonomous work. The study states that since transformational leaders understand the importance of sharing vision and working with people; therefore, they are more into delivering success to the organization (Al Harbi, Alarifi & Mosbah, 2019). Under transformational leadership, organization's innovation becomes clearly visible. In education industry, it is essential for the leaders to come up with new strategies and techniques as that not only amends teaching quality but also increases student's engagement in learning. Therefore, in this realm, creative environment is essential so that teachers and students can collaborate and share their ideas to improve the learning journey.

From the study, it is analyzed that transformational leaders focus on visionary initiatives, supportive culture, functional expertise and intellectual stimulation; therefore, all these efforts engage the employees in innovative work behavior. A supportive environment is developed through inspirational and motivational considerations and transformational leadership is typically focused on all these elements; hence, it embraces innovation in the work culture. On the other hand, from the study it is also analyzed that technological innovations significantly impacts education system at all levels; however, it often disrupts traditional classroom environment (Al-Husseini, El Beltagi & Moizer, 2021). Authors and scholars have a distinct opinion about technology and education, and it varies as per the situations. For example, many believe that technology has made the process of learning easier; however, many oppose that extensive use of technology makes people dependent on artificial intelligence sources. Despite of having various opinion about technology, one thing remains unchanged that is technology has profoundly changed or developed education sector. Comparing the scenario with traditional methods, education is not confined to same classroom or building. Today, technology has enabled students and teachers to collaborate with each other; hence, it has also improved communication patterns as well as relationships among teachers and students (Baruah & Paulus, 2019).

Technology has also begun to change the roles of teachers and learners as it is a powerful tool that helps both teachers and students to share instructional materials with each other whenever required. For example, with the worldwide reach of the internet and smart devices students can connect with the educators; hence, a new age of education is dawning. Additionally, the use of technology in schools makes the processes easier for the administrative department and reduces the work burden on manual tasks (Halász, 2021). However, at the same time the management needs to focus more on accuracy and transparency aspects.

## **Recommendations to Foster Innovation, Change, and Drive Growth in Education**

In terms of driving growth in the education sector, it is vital to focus on enhancing accessibility towards technological resources wherein schools should provide accessibility to the students for different learning modules and sources. In this respect the district should also focus on investing in helping the education institution providing technical education services to the students. However, the use of technology for students should be confined to studies and learning; hence, parents as well as should ensure to provide access to only learning materials. Thus, the technical sources can be protected through passwords and security codes. This way the screen time of students on technical gadgets can be minimized (Khan & Khan, 2019).

From the study, it is also analyzed that technology becomes challenging when teachers and educators are not professionally sound in technical areas. In terms of recommendation, it is essential for the education institution to organize teacher training sessions on different topics which guides and trains teachers and equips them with technical skills. In addition to this, leaders need to ensure that change is being communicated to the educators and teachers prior implementing it so that resistance related issues may not come. Also, to foster innovation in the education sector, it is crucial for the leaders to stay updated and utilize all resources to maintain the competitive aspects. Leaders should inspire the followers to focus on improvements and developments as that not only helps students to achieve their academic standards but also makes leaders professionally active. Kim & Park, (2020) in this respect says that collaboration and innovation are essential skills for educational leaders as it assists them to create positive changes for the learners and other people (Ismail, Alriyami, & Alhosani, 2023).

For a transformational leader it is highly crucial to define the vision and values and to share purpose and direction for collaborative and innovative efforts. Communicating and sharing the vision can serve as a guide that can further help in evaluating progress; hence, it can clearly determine achievements as well as failures both. It is recommended to the transformational leader to develop a growth mindset in which he or she should inspire the followers to improve the abilities and skills through continuous effort and feedback (Alkaabi, 2023; Almaktoom & Alkaabi, 2024; Kraus et al., 2021). At the same time, the culture of learning environment is important to create that can support and value learning as an ongoing process of improvement and adaptation (Alkaabi & Almaamari, 2020; Al-Zoubi et al., 2023; Alkaabi, 2021). This way the education leader can also encourage the educators and learners to embrace challenges and learn from mistakes (Ramadan & Ismail, 2023).

## **INSIGHTS INTO TRANSFORMATIVE POWER OF INNOVATION**

Typically, innovation is about change towards improvement and it is critically important for education sector as it transforms the system. Innovation has been considered as the most widespread vehicle of systematic education which not only improves the academic aspects but also helps in developing new opportunities that can lead to better society (Matt, Molinaro, Orzes & Pedrini, 2021). Talking about the transformative power of innovation, it can be said that it encourages students as well as teachers to research, explore and use all available resources to uncover new things that can positively contribute to advanced learning. It involves different ways of looking at the problems; hence, helps people to come

up with effective solutions accordingly. However, Kwan, (2020) argues that innovation is not merely the use of technology or new inventions; but it is more about how change can contribute to developing educational services. Since, it improves critical thinking ability; therefore, it helps the students to sharpen their creativity and problem-solving skills (Bataineh et al., 2022; Khalil et al., 2023; Ibrahim et al., 2023; Qablan & Al-Qaderi, 2009).

In UAE, the Ministry of Education has released an innovation strategy for the purpose of promoting creative ideas and thoughts and this has eventually developed an innovation platform which allows educational authorities to come up with their ideas and opinion for further innovations. For example, in the year 2015 UAE released an innovation strategy focusing on EmiratesSkills and other language programs. In this respect, NIS aimed to develop innovation in the education sector through coming up with new as well as creative teaching methods which can equip students with new skills and capabilities. Smart Learning was one of the techniques that came into practice which not only helped in designing innovative curricula but also it helped the students and teachers to develop skills and knowledge in the domain of science, technology and arts. Additionally, under the recent UAE Innovates 2023 conference, it was announced that UAE aims to spread a culture of innovation on large scale by creating an environment which supports innovative and creative minds (Hogan, 2023).

UAE is counted as one of the prominent educations' hubs; hence, it remains an attraction for students and investors. UAE has been investing significantly in innovation and technology which results into increase of interest from UK students (wherein they wish to expand their career in UAE). In this respect, the Ministry of Education came up with 'Study in UAE programme' that not only attracts international students but also develops a platform to promote innovative strides. Under the programme, the country aims to bring together great minds and talents so that they can experience global hub for innovation (Thekaikoro, 2020). Through the visionary leadership, UAE is leading in artificial intelligence; hence, it established the first graduate-level AI university called the Mohamed bin Zayed University of Artificial Intelligence. In addition to this, the UE is also pioneering Artificial Intelligence & Robotics Series (AIR) programme to assist the student develop AI knowledge which also prepares them for the AI job market and assisting students in meeting established educational goals (Abdallah & Al-Kaabi, 2023). Thus, it is articulated that the culture of continuous innovation and improvement is embedded in UAE, and it is also providing many opportunities of further developments to the country.

In education sector, innovation includes finding better ways of doing things and it also develops new perspective of looking at the challenges. For example, the application of project-based learning is one of the critical approaches which promotes innovation and creative thinking wherein students are involved in multiple projects which enhances active and deeper learning (Luyten & Bazo, 2019). In education institutions, innovation goes beyond the basics as it combines a variety of disciplines in which both teachers and students can come up with different outcomes. Therefore, incorporating innovation and technology in education helps promote growth in academic and professional areas. It advances the learning cycle and assist pupils to gain diversified knowledge about different realms. As per Le & Lei, (2019), innovative classrooms prepare the students with stronger communication skills and develops team building with peers. This creates personalized learning environment for the students which develops differentiated opportunities and prepares the students for competitive and global industries. In the digital age, students learn and grow in innovative classrooms and retain more information about different aspects; thus, it develops their understanding ability to a deeper level.

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## Section 3

# Chatbots in Education and Educational Technologies

# Chapter 11

## Diversity Management as a New Organizational Paradigm: Leading With Cultural Intelligence (CQ)

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### ABSTRACT

*In an era of globalization and increased diversity, there is a wide agreement on the need to actively deal with diversity in educational organizations. In this scenario, the challenge of global competition for UAE schools requires principals to lead differently and deal more effectively with teachers from diverse cultural backgrounds and fulfil their diverse needs. There is strong empirical evidence for the positive link between effective diversity management and overall organizational effectiveness. This chapter sheds light on cultural intelligence (CQ) as a viable entrée from which leaders can manage diversity effectively and lead in multicultural settings successfully. This chapter also unlocks several key multidisciplinary trends between diversity management and organizational performance outcomes.*

### INTRODUCTION

By bringing culture to the level of the organization and even down to the groups of people working within 21st century organizations, leaders need to recognize that leadership and culture are two sides of the same coin. Livermore (2010) argued, “Leaders across every profession are being propelled into

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a culturally rich and diverse challenge” (p.13). Educational settings and schools are not different from others in this context. Schools in the UAE have become increasingly turbulent and more demographically complex with teachers of diverse cultural backgrounds working and interacting on a daily basis (Malik & Singh, 2017). In addition, organizational behaviours considered appropriate for a group of people are not the same for others. Such differences can cause a dangerous clash of cultural norms in educational settings.

This chapter casts light on diversity management as a new organizational paradigm by using the context of UAE schools, the world’s most diverse organizations.. It also crystalizes the concept of cultural intelligence (CQ) in light of a peculiar skill to lead in a more transformational manner and deal more effectively with teachers from diverse cultural backgrounds to fulfilling their diverse needs.

## **BACKGROUND**

The past three decades have been marked by significant growth in the empirical examination of the influence of diversity on individual, group, and organizational level outcomes (Herdman & McMillan-Capehart, 2010; Harrison & Klein, 2007; Williams & O’Reilly, 1998). This growth in diversity research casts light on the dramatic increases in the heterogeneity of the workforce (Williams & O’Reilly, 1998). These changing demographics of the population globally have been and will be increasingly reflected in educational organizations such as schools. More specifically, schools have become increasingly turbulent and more demographically diverse with teachers of different cultural, ethnic, and linguistic backgrounds interacting and working together (Malik & Singh, 2017).

In light of this globalization process, advancing conditions in the world have caused transformation in teaching and learning environments. For example, global educational trends, international rankings, new expectations for student achievement and school improvement have placed principals and teachers at the crossroads between traditional and the new meaning of educational change. In an increasingly unstable environment, the range of educational goals, the pressure of accountability, overload, the adaptation to ever-changing conditions and multifaceted diversity present intolerable conditions for satisfying work experiences (Fullan, 2007). According to Sadri and Tran, workforce diversity may introduce work conflicts or tensions because the differences in norms and values among groups from diverse cultural and ethnic backgrounds are likely to manifest themselves in various work-related attitudes and behaviors (2002). In fact, being part of a global work team with team members of diverse cultural backgrounds is different from being a member of a culturally homogeneous team to which most people belong to their local cultural settings (Ang & Van Dyne, 2008).

As global interdependence, multinational corporations, cultural and social interconnections of the global economy strengthen and invigorate, educational leaders must be more proactive on issues of diversity, act differently, and most importantly lead differently (Williams & Tierney, 2013). This chapter sheds light on this interdisciplinary and multidimensional concept of diversity with the promise of unlocking the “black box” between diversity management and performance outcomes in educational settings.

## **WORKFORCE DIVERSITY IN EDUCATIONAL ORGANIZATIONS**

Within the context of increased globalization, organizations face the rapidly changing composition of the workforce, a phenomenon known as workforce diversity (Bhadury et al., 2000). This composition mirrors increasing numbers of employees with diverse demographic and cultural backgrounds based on gender, race, ethnicity and nationality, resulting in heterogeneity in socio-cultural perspectives, world views, norms, values, language, life style and behavior (Bhadury et al, 2000; Thomas, 1992).

Diversity is multidimensional and it encompasses various aspects of today's society in the United Arab Emirates. Schools in the United Arab Emirates are culturally diverse and reflective of the multinational nature of the population (Aldhaheeri, 2017). The UAE is a multicultural, multiethnic, multireligious country with a population of around 10.17 million people, consisting of both citizens and expatriates from various countries around the world (UAE Population Statistics, 2023; World Population Review, 2023; Aldhaheeri, 2022; Aldhaheeri, 2017; Siemund et al., 2021; Garces-Bacsal et al., 2021). Out of this number, only 1.17 million, are UAE nationals (i.e. Emiratis). The rest of the population, nearly 9 million are expatriates mainly from Asia, the UK, the USA, and other Arab countries. Schools in the UAE have become increasingly diverse with teachers of different cultural backgrounds interacting and working together (Al Jenaibi, 2012; Malik & Singh, 2017; Aldhaheeri, 2017). Hence, diversity in the workforce has become a demographic reality reality encompassing culture, gender, age, nationality, social class, socio-economic status, and religion (Allen, 1995; Sadri & Tran, 2002).

## **BENEFITS OF WORKFORCE DIVERSITY**

The last three decades have been marked by the empirical exploration of the influence of diversity on individual and organizational level outcomes (Williams & O'Reilly, 1998; Herdman & McMillan-Capehart, 2010). A growing body of literature indicated that a well-managed diverse workforce has numerous potential competitive advantages for organizations (Cox & Blake, 1991). Managing a diverse workforce involves more than awareness, acceptance, and tolerance of individuals from diverse cultural, ethnic and linguistic backgrounds. On the positive side, research has shown that effective management of diversity can lead to increased organizational productivity (Richard, 2000), improved problem-solving and decision-making (Cox & Blake, 1991; Carrell et al., 2006; Pitts & Wise, 2009), enhanced creativity and innovation through considering divergent viewpoints (McLeod et al., 1996), a growing ability to compete with the global market through leveraging the skills and knowledge of diverse employees (Carrell et al., 2006; Cox & Blake, 1991).

A diverse workforce can improve organizational performance by introducing new and different perspectives into organizations that may enhance decision-making (Stazyk et al., 2021; Kochan et al., 2003). Researchers have also contended that group members with diverse cultural backgrounds tap broader range of networks and bring diverse perspectives and ideas to problem-solving which result in higher quality information sharing, creativity, and more discussion and exchange of ideas (Cox & Blake, 1991; Malik & Singh, 2017; McLeod et al., 1996; Stahl et al., 2009; Stazyk et al., 2017). Organizational leaders should value and manage diversity to reap the benefits of diversity. Relevant literature indicates that effectively managed workforce diversity lowers employee frustration and turnover, particularly for women and people of color (Cox & Blake, 1991; Cox & Smolinski, 1994; Gilbert et al., 1999).

## **THE DARK SIDE OF WORKFORCE DIVERSITY**

On the negative side, diversity has been associated with undesirable personal and interpersonal outcomes namely decreased job satisfaction (Williams & O'Reilly, 1998), decreased organizational commitment (Tsui et al., 1992), growing interpersonal conflict (Carrell & Mann, 1995), low social cohesion and decreased group performance (Kochan et al., 2003; Watson et al., 1993). Workplace diversity has also been linked to adverse organizational outcomes such as increased absenteeism (Carrell et al., 2006; Tsui et al., 1992), and higher turnover rates (Jackson, 1992; Carrell & Mann, 1995).

Research on managing diversity has shown that organizations with highly diversified workforce may experience employee conflict, miscommunication, and mistrust (Pitts & Wise, 2009). In light of this, as an organization's workforce diversifies, it becomes harder to understand how one fits within a group or an organizational setting. Conflict becomes more common, communication breakdown happens more frequently, it becomes more difficult to integrate and coordinate workers, and employee dissatisfaction and turnover become more prevalent (O'Reilly et al., 1989; Pitts & Wise, 2009). Moreover, human behavior is influenced by stereotypical concepts and a content-related bias favoring culture. In fact, culture has been shown to influence one's cognition and perception. People tend to behave preferentially towards people with the same cultural background (Alifuddin et al., 2022). Although this cannot be considered an error from a specific cultural perspective, it can hinder social relations with people from diverse cultural backgrounds leading to low levels of partnership and stimulating intergroup conflicts (Alifuddin et al., 2022).

Familiarity or experiences with other cultures may temper misunderstandings (Ang & Dyne, 2009). Research on demographic heterogeneity among group members also emphasized that communication and cohesiveness may diminish as members of groups become dissimilar (Cox, 1991). Destructive intergroup conflicts, which may be present with diverse workforces, can happen due to language barriers and/or cultural clashes. In addition, perceptions of similarities and dissimilarities considerably influence work-related behaviours and outcomes (Sadri & Tran, 2002). For example, school leaders may react more negatively toward teachers perceived as dissimilar to themselves than toward teachers perceived as similar. Therefore, such adverse reactions/behaviours can limit the individual's potential and, eventually, the organization's potential. These adverse reactions/behaviours include stereotyping, personal bias, ethnocentric beliefs, micro-inequities, and ineffective communication. Finally, all these adverse reactions lead to employee perceptions of inequity in the workplace (Sadri & Tran, 2002).

### **The MBI Approach and Managing Multicultural Teams**

Culturally diverse teams are inevitable in today's globalized world and organizations. In theory, diverse teams should give organizations a significant competitive edge by combining a variety of viewpoints, knowledge bases, and creative problem-solving techniques. But in reality and practice, global teams do not often create the value expected. Instead, members clash, because cultural differences prevent them from getting along well and prevent teams from moving forward, resulting in conflicts and immobility (DiStefano & Maznevski, 2000). Thus, the first key idea in the MBI approach is *mapping* to comprehend cultural differences (DiStefano & Maznevski, 2000). This strategy was implemented to foster achievement, settle conflicts, and provide value in multicultural teams (Figure 1). Multinational team members can determine whether differences will cause barriers to interaction and have an impact

## ***Diversity Management as a New Organizational Paradigm***

by using the mapping approach to understand cultural differences and the fundamental characteristics of each member's approach to the team.

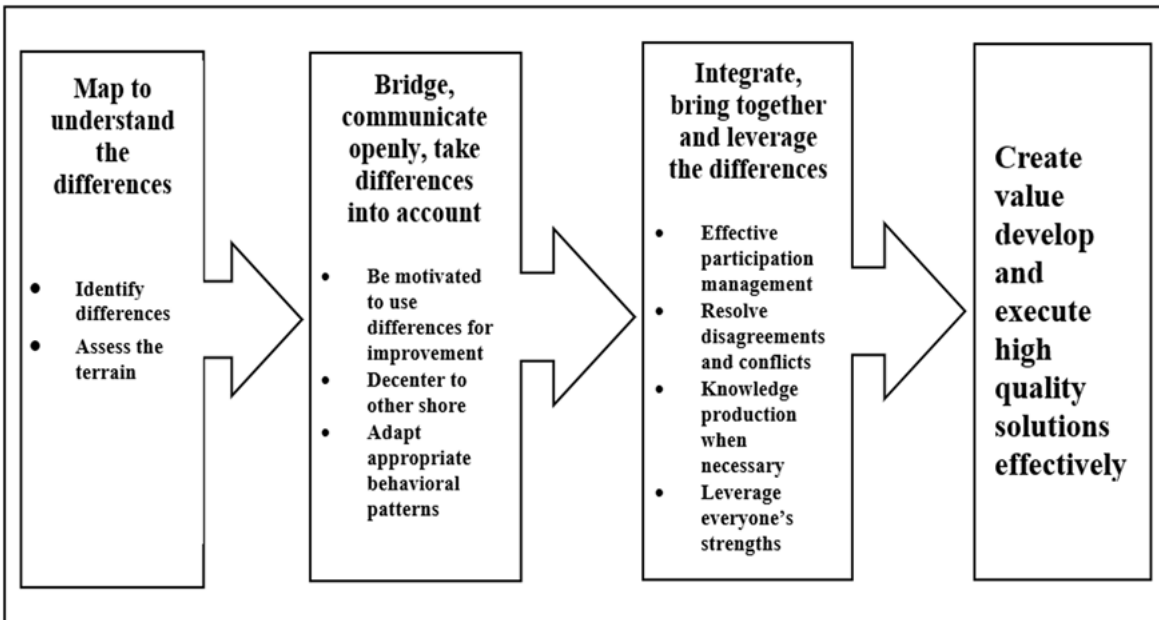
The second MBI method principle is to *bridge*, or communicate effectively across differences to bring team members and ideas together. Workplaces containing people from various cultural origins can be effectively managed if everyone is driven to convey differences boldly. In fact, team members might not be inspired to leverage these differences to boost performance after mapping to identify significant cultural differences. But as soon as team members make the first steps to effectively communicate and work together, productivity and creativity with positive outcomes as well as more sophisticated abilities and increased confidence follow. Decentering is one of the key competencies in creating a bridge within a heterogeneous team (DiStefano & Maznevski, 2000). Team members employ what they have learned about one another's differences through mapping to modify their own thought processes and behavioral patterns in order to decenter. This entails adapting their interactions and conversational style to the cultural norms of the individuals they are dealing with. Sustaining judgment is a crucial skill for fostering harmony in a multicultural team. People have a typical inclination to automatically interpret differences negatively. "They" are evil and incorrect, while "we" are right and good. However, everyone can learn to perceive things from others' perspectives through effective dialogue, decentering, and suspending judgment. Organization team members can collaborate and promote decentering throughout the organization by being receptive to various communication modalities, paraphrasing techniques, and questioning approaches.

In the MBI approach, leveraging disparities through the *integration* of ideas is the third principle. When knowledge from the mapping step and communication from the bridging stage are integrated, useful outcomes are produced. Effective participation management is one element of integrating and bringing ideas together to harness diversity. By using different meeting and information-sharing methods, leaders can manage heterogeneous teams in a successful manner (DiStefano & Maznevski, 2000). By allowing people to contribute in the ways that suit them best, this method utilizes everyone's abilities. But once concepts are put out there for debate, arguments or confrontations over them are unavoidable. When team members and leaders learn to map and bridge cultural gaps, they will see decreased conflict at work and increased motivation innovation and performance advantages.

## **Culture and Organizational Behavior**

In a globalized world, leadership has become a multi-cultural challenge for many leaders who face the complexity of cross-cultural differences daily. Livermore (2010) argued, "Leaders across every profession are being propelled into a culturally rich and diverse challenge" (p.13). According to Minkov, cross-cultural differences in organizations can cause serious cultural conflicts (2011). Thus, an overarching conception of culture in analyzing various aspects of organizational behavior is functional in educational organizations. Some leadership behaviors that appear effective in one situational context may be experienced ineffective in another (Deng & Gibson, 2009). In this scenario, the challenge of global competition for UAE schools requires principals to lead in a more transformational manner and deal more effectively with teachers from diverse cultural backgrounds.

Figure 1. Creating value in diverse teams: The MBI approach



### Cultural Intelligence (CQ) Dimensions (A Four-Dimensional Construct)

The origins of CQ can be found in Intelligence Theory. Intelligence can be conceptualized as the “capability to adapt effectively to the environment” (Sternberg & Detterman, 1986). Earley and Ang utilized this idea but augmented it so that it would be specific to a cultural context (2003). They also used Sternberg and Detterman’s (1986) multiple loci of intelligence theory, which reveals the strong relationship between intelligence and the different loci within the body, such as “biology, cognition, motivation, and behaviour” (Ang et al., 2014; Aldhaheri, 2017). “Biology” refers to the interaction between structural and process aspects of the brain (Ang et al., 2014). “Cognition” refers to both cognitive and metacognitive processes or, in other words, a person’s perception of their own and other individuals’ knowledge (Ang et al., 2014). “Motivation” refers to the cognitive processes of drive and choice (Ang et al., 2014), and “Behavioural” indicates the range of actions an individual uses, such as motor skills, verbal and non-verbal actions (Van Dyne et al., 2012). The CQ is “a capability that increases the manager’s ability to effectively interact with people from other cultures” (Jyoti and Kour, 2017, p. 306).

Following the lead of Sternberg and Detterman’s views, Earley and Ang (2003) conceptualized CQ as a multidimensional concept that includes metacognitive, cognitive, motivational, and behavioral dimensions. These four interrelated dimensions, which are also known as capabilities, collectively contribute to the concept of CQ (Collins et al., 2016; Earley & Ang, 2003; Ang et al., 2007; Sternberg et al., 1986; Brislin et al., 2006) (Figure 2). Metacognitive CQ is related to an individual’s cultural consciousness and awareness during interactions with those who have different cultural backgrounds (Van Dyne, Ang, & Koh, 2008; Ang et al., 2011). Moreover, metacognitive CQ reflects the ability to actively think about key assumptions as one is involved in cross-cultural contexts and revise such understanding and cultural knowledge accordingly. Metacognitive CQ not only promotes active cognitive process when an individual

## ***Diversity Management as a New Organizational Paradigm***

confronts a cross-cultural situation, but also activates the critical thinking behind reasoning, decision making, and judgement pertaining the situation. Research on the effects of metacognitive CQ concluded that high cultural metacognition was strongly associated with positive outcomes in intercultural relationships, including affective closeness and creative collaboration (Chua et al., 2012; Groves et al., 2015).

Cognitive CQ refers to an individual's frame of cultural references and knowledge of norms, practices, and conventions that exist in different cultural settings (Van Dyne et al., 2008). Cognitive CQ reflects an individual's knowledge of a specific cultural setting, which encompasses the fundamental knowledge of cultural similarities and knowledge of cultural differences. Similar to metacognitive CQ, cognitive CQ is inextricably related to decision-making and helps individuals to behave appropriately/aply in multicultural settings (Ang et al., 2007; Groves et al., 2015). Two longitudinal studies examining the effects of cross-cultural management courses on students' CQ found that in addition to significantly higher student CQ scores, such courses had a much stronger influence on cognitive and metacognitive CQ than on motivational and behavioral CQ (Eisenberg et al., 2013). The researchers concluded that cognitive and metacognitive CQ are affected by traditional academic class interventions while motivational and behavioral CQ are affected by purposefully designed experiential learning interventions or through direct experience with other cultures, gained by spending a meaningful amount of time abroad (Eisenberg et al., 2013). Research also shows that experiential activities such as having international work experiences and obtaining a degree from a foreign country, are important drivers of CQ enhancement (Ahn & Ettner, 2013).

Motivational CQ is the foundation of an individual's self-confidence concerning the ability to deal successfully with people who come from diverse cultural backgrounds. This self-efficacy effect is critical as it requires a high-level personal confidence to perform effectively in multicultural situations (Ang & Van Dyne, 2008; Earley et al., 2006). Motivational CQ sheds light on individual's interest and intrinsic motivation to adapt to new cultural surroundings, interact and function in cross-cultural settings (Van Dyne et al., 2009; Livermore, 2010).

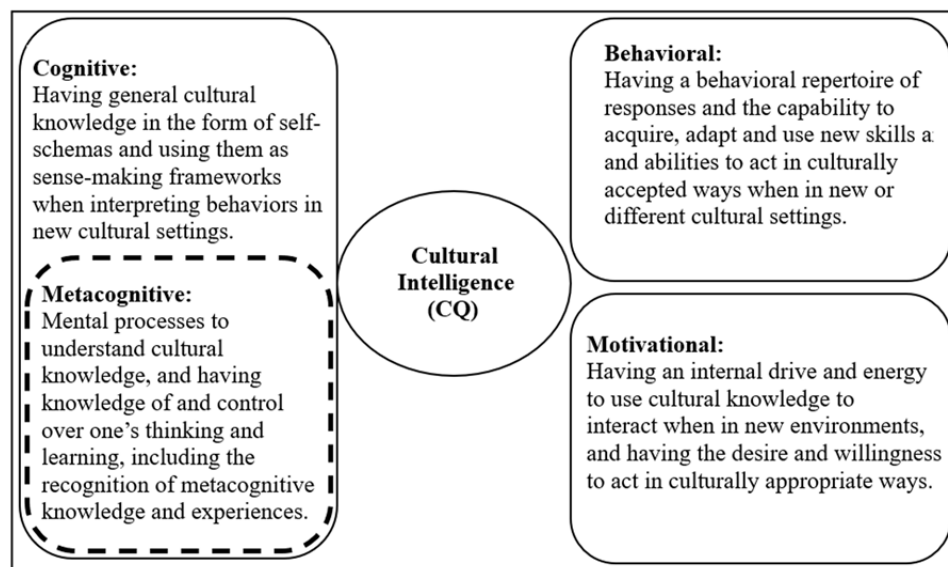
Prior research on cultural intelligence and cross-cultural adjustment crystalized the prominent role of the motivational CQ (Temper et al., 2006). Individuals with high motivational CQ are intrinsically motivated to experience new cross-cultural encounters and master their nuances (Earley & Ang, 2003; Temper et al., 2006). They value novel cultural interactions and enjoy interacting with people from diverse cultural backgrounds. "The motivational aspect of CQ requires a personal sense of efficacy and desire for enactive mastery as well as a positive evaluation of such situations" (Earley & Ang, 2003, p. 138). Motivational CQ triggers attention and effort, stimulates individual's cultural knowledge into guided action in new multicultural experiences (Temper et al., 2006). Hence, it expresses an individual's ability to effectively manage psychological stress during interactions in new and multicultural environments (Ramsey et al., 2011; Nosratabadi et al., 2020). Research on cultural intelligence and organizational performance found that leader CQ has a positive and significant influence on organizational performance (Nosratabadi et al., 2020). In this regard, the level of cultural intelligence empowers and motivates individuals to have the flexibility to consciously adapt to new cultural settings and effectively resolve any international conflicts that may arise in multicultural settings.

Behavioral CQ is an individual's ability to act appropriately when interacting with people and situations in an unfamiliar culture (Groves et al., 2015). It refers to the capability of an individual to demonstrate suitable verbal and non-verbal actions during cross-cultural interactions in any multicultural setting (Ang et al., 2011; Aldhaferi, 2017; Ott & Michailova, 2018). Earley et al. (2006) explained that behavioral CQ is important in how an individual can play a role very convincingly and consistently in a



multicultural environment. Hence, this type of performance requires a wide range of behaviors that can be consistently deployed based on the situation. Besides, Ang et al. (2007) asserted that behavioral CQ and motivational CQ are positively associated with an individual's cross-cultural adjustment, well-being, and task performance. Moreover, individuals with high behavioral CQ can appear as more effective and respectful communicators, because they have the ability to adjust the content, structure, and style of their communication. From a practical viewpoint, cultural intelligence also refers to being skillful and flexible regarding understanding a new culture, showing interest in learning more about it from ongoing interactions, and gradually reshaping one's thoughts to be more sympathetic to the culture and habits of others (Alifuddin et al., 2022; Thomas & Inkson, 2017).

*Figure 2. Dimensions of CQ by Earley and Ang's (2003)*



## **Relevance of Cultural Intelligence in the UAE Context**

The United Arab Emirates (UAE) has witnessed remarkable growth since its foundation in 1971. Initially fueled by the discovery of oil and gas, the UAE has become home to a large number of migrant workers, who play a prominent role in the country's economy and society (Siemund et al., 2021). Due to the diverse population in the UAE, the influx of citizens and expatriates from all over the world continue to live and work in multicultural environments. This has resulted in the interaction of people from diverse language, traditions, cultural and ethnic backgrounds. Cultural diversity has been shown to have a number of positive organizational outcomes such as creativity and competence. It can also lead to problems such as communication breakdown, dysfunctional adaptation behaviors, and the creation of barriers, which in turn reduce the positive aspects that cultural diversity can bring (Aldhaheri, 2017; Al-Jenaibi, 2017; Groves et al., 2014).

There is a strong demand for leaders with the necessary skills to lead culturally diversified teams (Groves & Feyerherm, 2011; Ang et al., 2011; Aldhaheri, 2017). The concept of CQ has gained con-

## ***Diversity Management as a New Organizational Paradigm***

siderable attention in multidisciplinary research. It is referred to as CQ, because it is conceptualized as a facet of intelligence (Ott & Michailova, 2018). Earley and Ang introduced the concept of CQ in the context of managers in an increasingly diversified international business (IB) world (Collins et al., 2016); however, the concept can be applied to school leaders and teachers in the education field, where diversity is also increasing (Ng et al., 2012; Musah et al., 2023).

Today's educational organizations cope with challenges in response to the expectations of globalization, international competitiveness, and increased diversity. According to Hofstede, intercultural differences have always been a challenge confronting multinational organizations (1991). Cultural diversity is very much reflected in the make-up of the UAE education system and its schools. School principals are at the crossroads of leading schools that have become more demographically diverse with teachers and students from different cultural and ethnic backgrounds (Jaeger et al., 2016; Ng et al., 2012). Culture in this particular context refers to any group of people who have context refers to any group of people with a shared way of seeing and making sense of the world (Livermore, 2010). Therefore, managing such culturally diverse schools poses significant challenges for school principals. Scholars agree that a much higher adaptability is needed to work within all of the cultures (Livermore, 2010). Additionally, school principals need to be culturally intelligent and sensitive to the cultural differences of all teachers (Collins et al., 2016).

Empirical studies have shown that managers, who are able to generate new interpretations and behaviors in a culture where their learned cues and behaviors do not fit, have high CQ (Livermore, 2010; Ott & Michailova, 2018). Individuals with high levels of CQ are characterized by being culturally competent, have a repertoire of cognitive, behavioral, and motivational abilities to work and function effectively with members of different cultures and adapt to foreign environments (Ott & Michailova, 2018). For example, school principals with high CQ expect that misunderstandings can happen in cross-cultural experiences and, as a result, they delay personal judgment of any situation until they accomplish proper understanding (Brislin et al., 2006). This knowledge and acceptance of cultural differences can be increased with practice, experience, and a positive attitude toward lifelong learning. Additionally, educational leaders, who recognize the great importance and value of cultural intelligence (CQ) can benefit from cultural differences by using (CQ) as a strategic and competitive tool in order to help achieve organizational goals (Zirak & Ahmadian, 2012).

One important and critical skill of individuals who are culturally intelligent is the expectation of misunderstanding (Brislin et al., 2006). Culturally intelligent people usually expect that they may encounter specific events or behaviors in a new cultural setting that will not be understood immediately. This is related to what Triandis (2005) calls "suspending judgement". In this context, people who are culturally intelligent not only delay judging the situation until more knowledge and understanding are gained, but also give themselves the space to accept the state of not knowing, which is known as confusion acceptance. Accommodating the state of not knowing reduces levels of anxiety and stress during cross-cultural interactions. Lowering levels of stress during cultural communications can allow individuals to evaluate the situation better and understand the new stimuli from the perspective of the other culture, moving toward recognition, respect, and reconciliation (Brislin, 2002).

### **Outcomes of Cultural Intelligence (CQ)**

Cultural intelligence (CQ) is a construct which is "motivated by the practicality of globalization in the workplace" and can be described as an individual's capacity to operate and manage in multicultural environments (Ang & Van Dyne, 2015). Leaders who are culturally intelligent will exhibit a range

of behaviors that allow them to adjust to a multi-cultural environment (Presbitero & Toledano, 2018; Henderson et al., 2018).

An important study highlighted the value of CQ in the workplace as having “provided the most promising evidence to predict a range of psychological, behavioral, and performance outcomes” (Leung et al., 2014, p. 495). A number of empirical studies have examined CQ in both international and intercultural settings. For example, (Mor et al., 2013) found CQ encouraged intercultural collaboration.

Research has identified several individual and interpersonal outcomes linked with CQ of managers who lead highly diverse multicultural organizations. For instance, individuals with high CQ are culturally competent. They expect that misunderstandings may happen in other cultures and as a result, they delay the judgement of any situation until they accomplish understanding all its dimensions (Brislin et al., 2006). Individuals with high CQ have a repertoire of cognitive, behavioral and motivational abilities to work effectively with people from diverse cultural backgrounds (Ott et al., 2018). Several studies also showed that cultural intelligent leaders positively influence organizational innovation, team effectiveness, task performance, and intercultural negotiation (Collins et al., 2016; Temper et al., 2006).

Research on CQ and cross-cultural experience crystalized the notion of multicultural identity which triggers CQ and enhances its development (Pidduck et al., 2022). Individuals, who are exposed to different cultures other than their own, are more likely to view themselves as a multicultural person. Having said this, individuals with a multicultural identity attach greater personal value to their cross-cultural experiences, as these are crucial to who they are and how they view themselves. That is, a multi-cultural identity serves as a lens through which individuals attach meaning to their cross-cultural experiences and transform those experiences into CQ (Pidduck et al., 2022).

## **FUTURE RESEARCH DIRECTIONS**

To stay relevant and address the challenges of an increasingly diverse and interconnected world, future research directions for cultural intelligence and diversity management may include CQ and employee well-being, artificial intelligence and diversity management. For instance, examining the connection between CQ, diversity management, and employee well-being is important from the perspective of this chapter. This can involve research on the unique stressors faced by diverse employees in the workplace. These future research directions can help organizations and individuals better navigate the challenges and opportunities presented by cultural diversity and develop more effective strategies for fostering inclusion and cultural intelligence in various contexts.

## **CONCLUSION**

This chapter joins the promising and multidisciplinary research in crystalizing the prominent role cultural intelligence (CQ) plays in highly diversified settings such as the UAE. Key highlights from this chapter recommend that educational leaders, senior leaders, and school principals should equip themselves with unique leadership competencies such as CQ. This is because principals with higher levels of CQ can significantly influence teachers' identification with their organizations deal with diversity effectively.

Cultural intelligence and diversity management are critical components for the success and sustainability of multicultural organizations. Embracing diversity and fostering a culture of inclusivity not only

## ***Diversity Management as a New Organizational Paradigm***

benefits organizations but also contributes to a more harmonious society. Organizations that prioritize these principles are better positioned to navigate the difficult waters of our globalized world and thrive in the face of diversity.

### **Practical Implications**

Leaders with high levels of CQ can effectively function in new cultural environments, establish open communication with people from diverse cultural and linguistic backgrounds, and leverage the differences of the followers to contribute to a common organizational goal. Furthermore, when school leaders are culturally intelligent, they can indirectly and easily change their ways of interaction according to the culture of the people they are working with. Finally, these quick adaptations can contribute to building a strong bridge in a diverse team, where each and every one feels included and acknowledged.

### **Policy Implementations**

Managing diverse workforce through establishing formal diversity programs have been found essential in shaping employee perceptions of diversity climate. For example, diversity management policies must be officially enacted in schools in order to portray the degree to which organizations are committed to treating their employees equally and fairly. In the end, effective enactment of tolerance initiatives in educational settings contribute to eliminating feelings of ethnocentrism, shaping strong perceptions of organizational fairness and organizational inclusion and fostering a tolerance culture among multicultural teams.

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## **KEY TERMS AND DEFINITIONS**

**Cultural Intelligence (CQ):** The individual's capability to function effectively in cross-cultural interactions and interact with people from different cultural backgrounds.

**Diversity Management:** It refers to strategic process of creating and maintaining an inclusive work environment that values and respects individual differences among employees.

**Organizational Identification (OI):** It represents the extent to which an individual perceives themselves as a part of, and emotionally connected to, the workplace they work at.

## Chapter 12

# Chatbots in Classrooms: Tailoring Education and Boosting Engagement

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### ABSTRACT

*In the digital age, businesses must enhance customer experiences, with artificial intelligence (AI) chatbots proving pivotal in this endeavor. These chatbots, powered by AI, deliver personalized customer interactions, reshaping customer engagement. Operating through websites and mobile apps, they address user queries in real-time conversations. This chapter examines the potential of chatbots in education, elucidating benefits for students and educators. Categorization and functions of educational chatbots are explored, alongside insights into their design and development, leveraging machine learning and language processing. The advantages of chatbots for students are underscored. Ethical considerations are essential when deploying chatbots, ensuring security. Overcoming barriers in education, the chapter proposes strategies to optimize chatbot use, fostering effective implementation.*

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## **INTRODUCTION**

### **Introduction to Chatbots in Education**

In recent years, technology has become the driving force behind rapid evolution in various landscapes (Bataineh et al., 2022; Khalil et al., 2023; Qablan et al., 2023). In the field of technology, chatbots are computer programs crafted to emulate conversation with human users, utilizing natural language on platforms such as applications, websites, and mobile apps. These digital assistants, a form of artificial intelligence (AI), facilitate interactions between individuals and service providers. According to research by Dashly (2023), the market for chatbots is projected to expand to \$10.5 billion by 2026. The education sector has seen a significant increase in the use of advanced AI tools, particularly in response to the pandemic. These technologies accelerate the dissemination of information and improve aspects of the educational process, such as personalizing tuition and feedback delivery (Baskara, 2023; Ibrahim & Alhabbash, 2022).

The pervasive influence of technology in education has led to students having effortless access to information via smartphones and tablets (Fateel, 2019). Incorporating chatbots into various platforms and learning management systems enhances the educational experience. Through language processing and machine learning, these tools provide personalized, immediate support to students (Kooli, 2023). Chatbots promote engagement by offering instant messaging, virtual assistance, and the distribution of study materials. Chatbots are effective in delivering information, assisting students with academic tasks, and facilitating institutional activities (Kooli, 2023). Their rapid response capabilities lead to increased user satisfaction and the prompt resolution of inquiries. Such immediate support renders chatbots indispensable for both students and educators. Educational institutions find chatbots to be cost-effective, as they can manage numerous inquiries simultaneously with minimal human involvement. This efficiency enables institutions to allocate resources more effectively (Karyotaki et al., 2022).

Furthermore, the automation of repetitive tasks and queries significantly boosts the efficiency of educational institutions. By handling routine inquiries, chatbots free up administrative teams to concentrate on more pressing matters, which allows them to devote their energies to areas that require human insight and expertise (Karyotaki et al., 2022). This shift in focus is instrumental in enhancing the overall functionality of educational institutions. Simultaneously, the integration of chatbots empowers educators to hone their teaching methodologies and focuses on innovative and student-centered approaches. In this rapidly changing nexus of technology and education, chatbots have become indispensable, not only streamlining communication and fostering student engagement but also effectively optimizing resource allocation. Their role in modern education is increasingly becoming that of a critical facilitator, reshaping how educational content is delivered and experienced.

## **MAIN FOCUS OF THE CHAPTER**

### **Benefits of Chatbots in Education: Unleashing the Power of AI Chatbots in Education**

Artificial intelligence has been a catalyst for significant changes across numerous sectors, including the field of education. AI-driven chatbots have become vital in transforming educational approaches. These

digital assistants are redefining the dynamics of student-teacher interactions by providing personalized support, boosting engagement, and encouraging ongoing learning. This article delves into the varied uses of AI-powered chatbots in education and emphasizes their role in reimagining learning processes.

AI-powered chatbots have brought a paradigm shift in education by offering tailored learning experiences and enhancing student engagement. They function as intelligent tutoring systems and create specialized learning environments where students engage with AI-curated content. This interaction enriches the learning experience and simplifies complex topics through interactive virtual teaching. Teachers also recognize the value of chatbots for their consistent communication and their role in recording interactions to assess student progress. They gather and analyze data from interactions and provide insights to improve the user experience. With their vast data storage capabilities, chatbots equip students and educators to tackle intricate problems, thus enhancing the learning cycle. These AI tools identify and address potential challenges, and in doing so, aid in student retention and assist students in efficiently managing their studies and assignments (Alqodsi, 2013).

A defining feature of AI-enabled chatbots is the provision of personalized learning experiences. They track individual study habits and offer bespoke attention and tailored learning pathways. Chatbots not only inform students about their data consumption patterns but also keep them updated on their educational progress. Acknowledging diverse learning styles, chatbots offer customized experiences to meet individual needs in and out of the classroom. They support personalized instruction, complement traditional teaching methods, and cater to students' strengths and weaknesses across various subjects.

Enhanced engagement is a key advantage of integrating chatbots into educational settings. With most students owning personal smart devices, chatbots facilitate the exchange of study materials and course-related information, thus enriching the learning experience. In higher education, chatbots streamline the enrollment process and improve communication between institutions and students. By providing prompt and accurate responses, chatbots help students stay focused on their educational goals, thereby boosting motivation and engagement. Moreover, the around-the-clock availability of chatbots enhances scalability and accessibility, which ensures users have access to timely assistance. This constant availability meets the instant-response expectations of many of today's learners, increasing user satisfaction.

Chatbots also lighten the load of administrative tasks, efficiently handling repetitive inquiries during admission periods, which saves time for students and staff. Their capacity to manage multiple conversations simultaneously ensures uninterrupted support for students throughout their educational journey. AI-powered chatbots are revolutionizing the educational sector by delivering personalized learning experiences, fostering heightened engagement, and supporting continuous learning. These multifaceted tools not only aid educators by streamlining administrative tasks but also ensure timely assistance. As the integration of technology in education progresses, the synergistic efforts of chatbots and educators herald a dynamic and effective learning environment.

## **Types and Functions of Education Chatbots**

The education industry has advanced technologically and is widely recognized for making significant profits, partly due to the assistance of chatbots. Across various internet platforms, education chatbots have been deployed and aid students, teachers, and staff members in diverse ways. Generally, chatbots have gained popularity in several areas, including online tutoring, student support, administrative management, and as information-providing resources. Education chatbots transform the way institutions

## ***Chatbots in Classrooms***

connect with students, with the primary goal of simplifying the learning process and ensuring student participation in activities to enhance their academic excellence (Pérez et al., 2020).

### **Information Chatbots**

Informational chatbots provide immediate access to course materials upon request in chats. They also play a crucial role in answering frequently asked questions. These chatbots deliver detailed information on subjects, enrollment processes, or events in schools. Sinha et al. (2020) found that chatbots assisted students by locating course details and providing comprehensive information. They also found that they serve as the first point of communication for students to obtain basic information about schedules, deadlines, assignments, and supplementary materials. Furthermore, these chatbots offer the convenience of accessing information anytime and anywhere. They also support administrative functions for teachers and students, managing schedules, appointments, reminders, and FAQs (Bahja et al., 2020). Information chatbots keep students and teachers updated on changes in school programs, thus effectively communicating information to a large audience simultaneously. Additionally, chatbots offer career guidance and help students identify their strengths and weaknesses and suggest appropriate career paths based on personal interests (Meshram et al., 2021).

### **Tutoring Chatbots**

Chatbots also serve as alternatives to traditional tutoring services. They provide personalized learning support and help students understand various subject dynamics. Chatbots analyze students' learning habits by monitoring study patterns, offering insights into content consumption, and assisting students in their academic pursuits (Agarwal et al., 2022). Educational institutions like schools and colleges utilize adapted tutoring systems to deliver personalized learning experiences, which better enables all students to excel academically. However, not all students learn effectively in traditional classroom settings, which has led to the adoption of chatbots that prepare customized learning plans and maximize knowledge acquisition inside and outside the classroom (Ji et al., 2023). These tools ensure students have access to study materials whenever needed. Additionally, chatbots are instrumental in collecting feedback. They assess student performance and provide comprehensive feedback on assignments and tasks. In this context, Palasundram et al. (2019) argued that chatbots graded assignments and identified areas for improvement, which saved teachers time on additional tasks.

### **Language Learning Chatbots**

The most common function of chatbots is their ability to communicate in various languages, which benefits both teachers and students in language learning. Chatbots provide vocabulary and grammar lessons, assist in conversations, and support pronunciation, all of which help students enhance their communication skills (Haristiani, 2019). These technologies also identify common mistakes and provide feedback for improvement. They are instrumental in offering personalized tips and assisting students in learning new words and developing their vocabulary. Another key feature of chatbots is their potential for creating a safe and secure learning environment where conversations remain private, which enables students to learn language etiquette.

Increasingly, chatbots are becoming vital platforms where students can practice speaking and writing in different languages without fear of making mistakes (Karyotaki et al., 2022). In many cases, chatbots are utilized to provide personalized language-learning pathways by analyzing students' interests, thereby accelerating their learning process through personalized feedback. Furthermore, chatbots are employed to develop and enhance language learning experiences by engaging with students in the target language (Chow et al., 2023). Often, students may hesitate to speak in a classroom setting due to a lack of confidence in the language. In such instances, many chatbots step in to facilitate private learning and immediate correction of mistakes.

## **Cognitive and Emotional Support Chatbots**

Chatbots not only serve educational purposes but also offer mental health support to students. They provide information on mental health issues, coping strategies, and additional support for students facing anxiety or depression challenges. Meng and Dai (2021) noted that chatbots have recently been utilized to provide empathy and support during stressful times. However, their study also raised questions about the emotional assistance provided by chatbots compared to human support. It has been observed that chatbots are effective in delivering mental health services by offering empathic conversations to a nonclinical population. This trend has led scholars and researchers to deepen their understanding of chatbots' potential in providing emotional support. Rathnayaka et al. (2022) highlighted that both conventional agents and chatbots were recognized as recent technological innovations successfully adapted for mental healthcare support. Chatbots offer first-level support for individuals requiring such services. Furthermore, it has been determined that most chatbots significantly incorporate cognitive behavioral therapy (CBT) techniques within their conversational pathways, although fully utilizing this capability is not overly common as of yet.

In summary, conversational chatbots are revolutionizing communication methods and fostering continuous, lifelong learning among students. Additionally, various types of chatbots provide valuable assistance to teachers and staff members, which eases their workload. For instance, teachers can rely on chatbots to handle repetitive tasks while staff members utilize them for administrative duties, ultimately streamlining their work processes.

## **Design and Development of Educational Chatbots**

### **Natural Language Processing and Machine Learning Techniques**

Natural language processing (NLP) is a component of artificial intelligence that enables computers to read and understand human language. The primary objective of NLP is to enhance human-machine communication by automating and simplifying tasks. NLP, a branch of AI, utilizes algorithms and AI models to analyze and comprehend human language, which enables chatbots to understand and generate responses that mimic human interaction (Huang et al., 2022). Building a chatbot with NLP involves several steps, including problem identification, selecting suitable NLP techniques, and testing them for implementation. Chatbots must be programmed to comprehend and process users' inputs effectively. Additionally, gathering diverse data sources like social media and customer forums is essential for training chatbots; this data must be labeled and encompass diverse scenarios (Kim, 2019).

## **Chatbots in Classrooms**

The data collection process is followed by pre-processing, which involves sorting, normalizing, and purging irrelevant information. Developers employ various NLP techniques, such as keyword-based and machine-learning-based systems, to create chatbots (Bahja et al., 2020). In education, keyword-based systems are suitable as they match user inputs to predefined responses. While easy to implement, they may struggle with complex inputs. Kumar (2021) suggested that educational chatbots should be restricted to study purposes to maximize their utility. Conversely, machine learning (ML) systems, which rely on ML algorithms, respond more effectively to complex queries, which provides benefits for students and improve over time with additional data.

## **Conversational Interfaces and User Experience Considerations**

Designing conversational interfaces that allow natural and efficient conversation flow poses a significant challenge (Jadhav et al., 2022). Chatbots strive to minimize user effort in system interactions. In the development of these interfaces, it is crucial to tackle multiple problems and provide solutions focused on the user. These interfaces offer personalized experiences based on the users' previous interactions and preferences (Chen et al., 2023). For instance, a chatbot in an educational app might tailor learning modules or coursework to align with a student's goals or subjects. Chatbots also support real-time problem resolution, thereby decreasing the need for extra staff for customer queries.

Regarding user experience, educational institutions should create specialized and goal-oriented chatbots to effectively engage their intended audience. Setting clear expectations about the chatbot's capabilities is essential (Tamrakar & Wani, 2021). It is important to define the interface's features and the chatbot's value for an enhanced user experience. User control is another vital aspect; chatbots should offer prompt feedback to avoid user uncertainty. Considering that immediate response is a fundamental expectation from chatbots, developers must give priority to response timing. For better accessibility, educational chatbots should refrain from jargon or overly complex language, which could lead to user confusion (Mageira et al., 2022). The interface should also provide straightforward options for initiating conversations and emphasize natural language to boost the chatbot's effectiveness.

## **Integration With Learning Management Systems and Educational Platforms**

The recognition of lifelong education's importance is growing and leading to an increased use of learning management systems in various educational programs. These systems are crucial for personalizing training and building individual development plans. Pears et al. (2021) identified that chatbots play a pivotal role in learning systems by developing programs that mimic teacher behavior. These programs effectively test students' knowledge by evaluating their answers, providing feedback, and creating learning plans. However, among the numerous tools designed to enhance the e-learning experience, the latest innovation is the LMS AI chatbot (Ashfaque, 2022).

The support provided by tutors alone may not suffice for many learners, as each student may require additional training or assistance. This gap underscores the need for a tool that can enhance the training process by meeting all learners' needs. LMS chatbots are designed to offer users continuous support and quick responses to their queries. These chatbots foster an unprecedented level of interactivity with improved responses. Artificial algorithms analyze student data to provide tailored support (Durall & Kapros, 2020). They also evaluate critical training process factors, such as performance aspects, language use, and keyword identification, which aid students in achieving quality education.



Many educational institutions also use LMS to assist teachers and students in accessing coursework and other materials. Integrating a chatbot with LMS can remind students of necessary actions to complete assignments (Skjuve et al., 2021). Additionally, bots can deliver new information on topics of interest to enhance students' understanding and help them address areas of weakness. Students use chatbots not only for instant information but also to receive feedback on their reports and assignments. Chen et al. (2023) noted that collecting feedback was crucial for improving performance and understanding how to strengthen users' capabilities. For example, teachers use chatbots on educational platforms to learn new techniques for improving teaching styles and communicating knowledge to students.

### Case Studies and Examples

#### Successful Implementations of Chatbots in Educational Institutions

According to an article by Badam (2023), the UAE's Minister of Education announced plans to integrate AI and machine learning technologies into teaching processes, introducing AI-generated tutors in classrooms. The Minister declared that these AI chatbot tutors would transform and strengthen the UAE's education sector. The Ministry of Education, in collaboration with partners like Microsoft and OpenAI, aims to revolutionize education by enhancing learning quality for students. However, the Ministry remains mindful of the teachers' roles to ensure they are not overshadowed by new technologies.

Generative AI and large language models are now in use in academic settings to innovate teaching methods. As Hsu et al. (2023) noted, these tools aid teachers in creating multimedia content, including audio, images, and video, to respond effectively to student inquiries. These powerful AI programs not only generate content but also provide reliable knowledge. In the UAE, education authorities are formulating policies for using this technology, with teachers utilizing it for effective interaction and communication, ensuring optimal learning (Mohasses, 2019). Beyond the UAE, institutions like Georgia State University, the University of Memphis, Arizona State University, and West Texas A & M University have begun employing chatbots to assist students in accessing reliable information about coursework and extracurricular activities. These universities recognize that well-developed chatbots can analyze students' specific needs and offer appropriate academic program advice. In Dubai, the Knowledge and Human Development Authority (KHDA) reported that over 600,000 students, mostly expatriates, benefitted from the implementation of chatbots, assisting parents and students in understanding educational options (Mohasses, 2019).

#### Results and Impact on Student Learning Outcomes

In the education sector, chatbots serve as virtual assistants that enhance both teaching and learning processes and facilitate understanding of complex concepts. Chatbots like ChatGPT are widely used to address diverse student learning needs. One key advantage of chatbots is their 24/7 availability, which reduces reliance on classroom teaching (Liu et al., 2022). Access to chatbots offers support and guidance, especially in challenging assignments or queries. Since learning styles vary, chatbots provide personalized learning experiences based on each student's needs and capabilities. Using students' learning history, chatbots can offer tailored recommendations to improve performance in specific subjects (Kumar, 2021).

Post-pandemic, students have become more reliant on technology for academic solutions and challenges. The education sector has evolved to become more tech-driven, using technology to inform students about

## **Chatbots in Classrooms**

lesson plans, course modules, and deadlines (Malik et al., 2021). Additionally, chatbot implementation has made learning more engaging by directing students to resources that present chapters and lessons creatively. This approach enhances students' analytical and critical thinking skills and prepares them for the future job market. Huang et al. (2022) argued that chatbots aided in skill development by providing tips and tricks for various activities. For optimal student learning outcomes, schools need to focus on creating the right atmosphere and providing comprehensive support.

### **Challenges Faced and Lessons Learned From Real-World Deployment**

Despite the many benefits of chatbots, there are challenges that should not be overlooked. Often, chatbots fail to meet user expectations, which results in a lack of confidence. For example, one major challenge in deploying chatbots is their lack of personalization. Chatbots may provide a prescribed, pre-set reply to certain queries that fall under certain topics, which can lead to a disconnect with users. Lidén and Nilros (2020) noted further that chatbots follow scripted responses, sometimes failing to address commands outside their programmed sequences, which results in repetitive responses. In today's tech-savvy environment, students seek instant responses to their queries. However, when chatbots are unengaging or slow to respond, users may lose interest.

Furthermore, solving complex issues requires expertise and a deep understanding of the subject matter, sometimes beyond a chatbot's capability (Al-Mutawah et al., 2019). For example, students often expect chatbots to address all their queries, especially when classroom learning is insufficient. Failure to meet these expectations can result in frustration. Chatbots may also lack some ability to engage in critical thinking, which leads to simplistic and sometimes inaccurate responses to complex issues (Hammad & Bahja, 2023). Complex tasks and projects usually require creative and innovative problem-solving approaches, yet chatbots often lack creativity and struggle to generate unique solutions (Jeon & Lee, 2023). This limitation stems from their programming, which typically yields generic ideas that lead to repetitive responses that diminish their usefulness in educational contexts. Human connection is also a factor that positively impacts student learning, but chatbots fall short in providing emotional support, which further hinders their effectiveness (Aleedy et al., 2022). Addressing user needs effectively requires understanding the issues at hand, a capability beyond the scope of chatbots as programmed software with inherent limitations. Not all tasks can be executed through technology, which underlines the importance of acknowledging technology's limitations in certain areas.

## **Ethical Considerations and Privacy**

### **Data Privacy and Security Concerns When Using Chatbots in Education**

Over time, chatbots have grown in popularity as artificial communication systems used for various purposes. Nevertheless, the security risks and concerns associated with them are significant and should not be ignored as they can present serious security challenges. There are multiple factors contributing to these security threats and vulnerabilities, which make it crucial to address the ethical aspects associated with AI (Sepahpour, 2020). For instance, unlike earlier rule-based models, modern chatbots operate through advanced natural language and machine learning techniques, which often begin conversations by requesting personal information. Chatbots typically collect personal data from users; however, this

data collection should occur only with the user's consent, and the data must be safeguarded against unauthorized access or disclosure (Ismail et al., 2023).

In this context, developers must ensure that chatbot responses do not reveal users' personal information or identities. Additionally, chatbots record user inputs and provide summarized data, but this input often includes personal or sensitive data that eventually gets stored in the chatbot database (Caprioglio & Paglia, 2023). Another crucial ethical aspect of chatbots concerns academic integrity, particularly when used for college coursework and assignments. Many students use AI tools to complete their work, submitting it as their own, which raises questions about the integrity of their work. It is vital for students to use AI tools for assistance in understanding topics or subjects, rather than relying on chatbots to complete tasks on their behalf. Furthermore, encryption can protect data and ensure sensitive data remains secure from unauthorized access (Durall & Kapros, 2020).

## Transparency and Responsible AI Practices in Chatbot Development

To foster trust between users and chatbots, promoting transparency is essential. For instance, when developing a chatbot system, clearly communicating the chatbot's capabilities and limitations is important so users understand how the chatbot functions (Gulyamov & Rustambekovich, 2023). Implementing explainable AI tools can provide insights into the chatbot's decision-making processes and help users understand the reasons behind the chatbot's outcomes and actions. Under responsible AI practices, developers must obtain consent from users before collecting and processing data. This ensures that the chatbot's data practices align with privacy policies (Pérez et al., 2020).

Educational institutions are increasingly providing AI tools to assist students and teachers in their learning and teaching journeys; therefore, maintaining transparency in usage is crucial. Maximizing transparency requires implementing a data regulation system like the European Union's General Data Protection Regulation (GDPR), which allows individuals to control their personal data. In education, transparency involves using students' personal data solely for academic purposes and not disclosing it without parental consent (Okonkwo & Ade-Ibijola, 2021). Additionally, outside the classroom, both students and parents are responsible for using AI in a manner that does not violate any legal aspects.

## Ensuring Inclusivity and Avoiding Bias in Chatbot Interaction

In education, while designing chatbots, it is crucial to consider inclusivity to ensure all students benefit from an improved learning experience. Making chatbots more inclusive is vital. For instance, AI-powered chatbots that recognize and respond to various inputs like voice, text, and images can assist students with special needs and enable them to gain maximum knowledge (Luxton, 2020). These chatbots customize the user experience and equip students with special needs to receive the same level of service as their peers. Inclusivity plays a key role in engaging users and facilitating positive experiences. Chatbots, programmed to understand users' emotions and responses, can provide appropriate and diverse responses to all students (Ramadan & Ismail, 2023).

According to Wang et al. (2023), the extensive use of artificial intelligence raises concerns about bias. AI-powered tools must be programmed to counteract social inequalities and embrace diversity and inclusivity in all contexts. To reduce bias potential, developers should adopt a proactive approach that fosters inclusivity in all programs. Educational institutions should design chatbots to respond to a wide range of identities and ethnic aspects, using AI-powered tools to create more equitable environments by

## **Chatbots in Classrooms**

embracing diversity and recognizing each user's unique needs. Thus, educational institutions can establish an inclusive and equitable world for all students. Developers should program a diverse set of data points into chatbots to prevent decisions based on stereotypes or inaccurate assumptions (Kim et al., 2019).

## **Future Research Directions**

The future of AI and chatbots in education appears promising, driven by their evolving capabilities in natural language processing and machine learning (Chiu et al., 2023). These tools offer immense potential for educational institutions, from identifying diverse learning needs to providing personalized tutoring. Chatbots are poised to revolutionize education by simplifying tasks like grading and feedback, which frees teachers to concentrate on interactive teaching (Abbasi et al., 2019). As education undergoes transformative shifts, chatbots streamline evaluation processes by efficiently analyzing student progress (Alqodsi et al., 2023).

However, these advancements present challenges. Overreliance on technology might reduce classroom engagement and human interaction, which highlights the need for a balanced approach (Wollny et al., 2021). Another concern is AI's potential to inhibit human thought due to its algorithmic nature. Yet, AI's ability to learn continuously from historical data offers customized educational pathways, an aspect that promotes equitable learning opportunities (Lidén & Nilros, 2020). Educators must prepare students to interact effectively with AI tools, cultivating essential future job skills (Yang & Evans, 2019). Integrating AI into education can transform pedagogical approaches and foster personalized learning plans, but they necessitate adjustments in classroom practices and assessment methods (Følstad et al., 2021). Tools like ChatGPT enable teachers to create engaging and personalized learning experiences and enhance critical thinking skills (Su et al., 2023). This integration promises a fruitful learning environment that can improve student outcomes and solidify AI's role in reshaping education.

## **SOLUTIONS AND RECOMMENDATIONS**

### **Preparing Personalization Aspects in Chatbots**

For developers, it is crucial to monitor chatbot performance continually to enable improvements. For instance, users often complain about a lack of personalization. Addressing this issue by updating the chatbot's program is vital for providing students with tailored solutions, which can lead to the technology's long-term success. On another note, evaluating the technology aids in identifying errors and loopholes, allowing for appropriate corrective actions (Jeon & Lee, 2023). Developers can gather data from bot interactions to identify patterns and areas needing improvement. Personalized services build trust and loyalty with users (Alqodsi & Aljahoori, 2023).

### **Quick Responses**

Immediate support is a key factor in enhancing user satisfaction, as people expect fast and efficient solutions. AI chatbots, available 24/7, require developers to ensure rapid response in providing immediate assistance. For instance, educational chatbots should offer quality, instant answers, especially outside the classroom, so students are not solely dependent on educators (Bii, 2013). Offering quick responses

improves user satisfaction and promotes the utility of the chatbot. Additionally, AI chatbots must provide accurate and reliable responses to reduce the risk of misinformation.

## **Understanding the Limitations of Chatbots**

Users, including students and teachers, must recognize that chatbots have limitations and may not always be effective. Chatbots, operating in machine language, sometimes fail to provide appropriate responses. Developers should prepare chatbots to direct users to alternative sources for accurate answers when the chatbot cannot meet their needs (Ji et al., 2023). Acknowledging chatbots' limitations does not diminish their value but clarifies necessary user adjustments.

## **Implementing Emotional Connect**

Emotions play a crucial role in human communication and aid in understanding context. Unfortunately, the absence of emotions in chatbots often results in unengaging conversations that make users feel unheard (Fryer et al., 2017). Developers should integrate emotional intelligence into chatbots to recognize human emotions and respond accordingly. For example, incorporating natural language processing allows chatbots to recognize sentiments and the context of user messages. Using emojis and emoticons might also make conversations more responsive and empathetic, thereby enhancing user connection. Overall, continual improvement in chatbots can boost user satisfaction and help educational institutions remain competitive (Skjuve et al., 2021).

## **CONCLUSION**

The widespread adoption of chatbots across various industries, including education, emphasizes their critical role in modern business operations. As the education sector faces increasing competition, adopting innovative technologies such as chatbots becomes essential to stay competitive. The integration of technology, particularly artificial intelligence and natural language processing, has revolutionized the way humans and machines communicate. Extensive research has highlighted the growing use of chatbots, with their potential being explored across different industries and transforming various services.

In the field of education, chatbots benefit not only students but also educators by offering diverse teaching methods and assisting in the creation and evaluation of coursework. The rise of online education has increased the significance of educational technology platforms (Qablan, & Al-Qaderi, 2009), where chatbots play a crucial role in efficiently communicating information about courses and admission procedures. These conversational agents are indispensable in managing administrative tasks in schools and universities, thereby streamlining applications and inquiries. A well-developed chatbot personality can enhance user experiences and contribute to user-friendliness and interactivity. Furthermore, chatbots act as valuable teaching assistants that enable educators to customize messages to meet students' needs, thus improving learning outcomes and strengthening teacher-student relationships. They facilitate valuable feedback loops and aid teachers in refining their teaching methodologies. However, it is important to recognize the limitations of chatbots and understand that their effectiveness depends on continuous updates and relevant inputs to ensure accuracy and timeliness in responses. Real-time conversational

## Chatbots in Classrooms

capabilities improve user engagement and make complex topics more accessible. Users must understand the scope of chatbots' capabilities and avoid posing irrelevant questions.

In an ever-evolving technological landscape, chatbots have become transformative tools in education and various other sectors. While their implementation requires ongoing improvement and user education, the advantages they offer in terms of communication, engagement, and streamlined processes are indisputable. As industries increasingly leverage the potential of chatbots, their integration into education signifies a dynamic future where technology and pedagogy seamlessly converge.

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## Chapter 13

# Transforming Education Through Technology and School Leadership


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### ABSTRACT

*In an era where technological advancements are shaping facet of our lives, education stands as promising domains for positive change. The fusion of technology and school leadership is revolutionizing the way students learn, teachers teach, and administrators manage educational institutions. This chapter explores the pivotal role that technology plays in school leadership, highlighting its potential to create a more effective, equitable, and engaging learning environment, there is no reason to assume a new gadget will result in new teaching practices if our technology integration tactics do not change. Students are producing remarkable work in some iPad courses. Tablets are generally used to duplicate current procedures, nevertheless. School leaders must work with their communities to develop a vision how new technology will improve instruction, support educators in imagining how new technologies can support those visions, and support teachers and students as they transition from using tablets for consumption to using them for curation, creation, and connection.*

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## **THE DIGITAL AGE AND EDUCATIONAL TRANSFORMATION**

The 21st century has seen an extraordinary expansion of digital technologies, ranging from widespread smartphone use to advancements in cloud computing and artificial intelligence (Smith & Jones, 2020). These innovations are more than mere tools of convenience; they act as pivotal agents in transforming the educational landscape. School leaders are now tasked with harnessing these technologies not merely as gadgets, but as vital components in cultivating an education system that is student-centered, globally connected, and adaptable to the ever-changing world. In this digital era, technology is intertwined with everyday life, offering opportunities for learning at any convenient moment. This novel approach to education, however, requires a thorough examination of its benefits and challenges, particularly in meeting the needs of modern students and in optimizing the teaching-learning process (Bilyalova et al., 2020).

The rise of the digital age has led to significant shifts in education, predominantly in preparing students for future workplace demands (Alkaabi et al., 2023; Bond, 2018; Qablan et al., 2023; Qablan & Al-Qaderi, 2009). Such a transformation calls for a clear and strategic vision from educational leaders and active participation from all stakeholders (Balyer, 2018). Essential competencies in this new era include proficiency in digital technologies and the ability to engage in a global context (Khalil et al., 2023; Rasskazova, 2020). Implementing technology in education holds promise for enhancing educational quality and, consequently, national welfare (Sitepu, 2022).

Schmidt and Cohen (2015) depicted the digital age as a time of both immense opportunities and significant risks, emphasizing the unprecedented growth of the virtual population that may soon surpass the physical one. Anderson (2015) raised concerns about a potential “digital dark age,” suggesting that the full potential of digital advancements might not be fully realized. Weller (2009) stressed the vital importance of universal digital access and the transformative power of digital interactivity on relationships, while also highlighting the need for authenticity in digital information. Lastly, Kaur (2019) examined the transformative impact of the digital age with a focus on the challenges faced by those struggling to adapt to rapid technological changes (Abdallah & Alkaabi, 2023; Bataineh et al., 2022).

## **EMPOWERING SCHOOL LEADERS WITH DATA-DRIVEN INSIGHTS**

In the past, decision-making in education often relied heavily on intuition and a limited set of data. Johnson et al. (2021) noted that the advancement of technology had equipped school leaders with powerful data analytics tools and provided deep insights into areas such as student performance, teacher effectiveness, and resource allocation. They observed that this shift towards data-driven decision-making had enabled leaders to make informed choices, which lead to enhanced student outcomes and more efficient use of resources (Jandigulov et al, 2023).

The importance of practically using student data for school development was underscored by legislation such as the No Child Left Behind Act (NCLB). However, Johnson et al. (2021) highlighted some challenges, particularly when student data was stored in formats that were difficult to access, modify, and analyze. This often hindered compliance with such regulations and limited the use of data to inform instruction at the classroom level. They also noted that recent developments in computer technology had improved the organization and accessibility of student data (Abdallah & Alkaabi, 2023). These advancements not only facilitated more straightforward accountability reporting but also provided user-friendly

data access at all educational levels. As a result, teachers were able to engage in informed reflection and refine their classroom practices with the aid of these technologies, as observed by Wayman (2005).

Numerous studies have delved into the significance of data-driven decision-making in the realm of school leadership. Badawy & Alkaabi (2023) highlighted the crucial role of distributed leadership in fostering a culture of continuous improvement and developing data-driven instructional systems. Building on this, Marsh (2015) offered a framework for enhancing teacher capacity in utilizing data by emphasizing the need for sustained support and professional development (Alkaabi, 2023; Alkaabi et al., 2023). Earl (2007) pointed out the necessity of data literacy and cultivating an inquiry mindset among school leaders. Collectively, these studies underscored the vital need for a collaborative, supportive, and data-literate leadership approach to effectively drive school improvement (Alkaabi, 2021).

## **PERSONALIZED LEARNING: TAILORING EDUCATION FOR EACH STUDENT**

One of the most notable advancements in educational technology is personalized learning (Davis & Wilson, 2022). Adaptive learning platforms, driven by AI algorithms, are adept at accommodating the individual learning pace and style of each student. School leaders play a pivotal role in promoting these tools as they can ensure that educators receive the necessary training and support for their effective implementation. The outcome is a more inclusive and tailored educational experience for every student. The concept of technology-facilitated individualized learning is gaining traction in the educational community as a learner-centered approach. Nonetheless, the effectiveness of technology-enabled personalized learning in terms of both learning outcomes and perspectives remains a subject of ongoing research and debate (Zheng et al., 2022).

With the emergence of technology as a key driver of educational reform, school leaders are increasingly passionate about revolutionizing how students learn (Ibrahim et al., 2024). This enthusiasm involves a deeper exploration of how technology can aid teachers in connecting with students in ways that resonate more effectively (Peterson, 2011). Concurrently, students are entering educational settings with new aspirations and ambitions to integrate knowledge, success, and thinking with technology. These learners engage, interact, and create in their world through technological means and find inspiration in their academic journey through technology (Abdallah & Alkaabi, 2023).

Personalized learning, which adapts education to the unique needs of each student, is recognized as a crucial approach for enhancing student achievement (Childress, 2014). However, its implementation varies among schools, with some focusing on individualized student support and others on competency-based progression (Johnsen, 2016). The effectiveness of personalized learning models is influenced by several factors, including flexible student groupings, supportive learning environments, and the freedom for teachers to choose instructional practices (Johnsen, 2016). Additionally, the design characteristics of personalized learning environments, such as learner self-regulation, real-time data, student agency, and universal design for learning, are fundamental to their success (Basham, 2016).

## **BREAKING DOWN BARRIERS: EQUITY IN EDUCATION**

School leadership is pivotal in defining the future of education and enhancing the teaching and learning process. Effective leaders, as Lytle (2012) noted, articulate their values and vision to elevate expectations,

## ***Transforming Education Through Technology and School Leadership***

establish direction, and foster trust. They are instrumental in reshaping conditions for learning, restructuring organizational aspects, redesigning leadership roles, enriching curriculum, elevating teacher quality, promoting internal collaboration, and nurturing external community relationships. This list underscores the dynamic and complex nature of school leadership and its continual evolution (Abdallah & Musa, 2023).

Digital inequality, as described by Martin et al. (2016), refers to the disparity experienced by diverse groups, distinguished by socioeconomic status, age, and gender, in accessing and utilizing digital resources. This concept, often termed “digital exclusion,” particularly addresses scenarios where segments of society are deprived of digital resources (Warren, 2007). To combat digital inequality, massive skill- and capacity-building programs targeting diverse races and regions are crucial. These programs, in response to the evolving challenges of digital inequality, necessitate a refocused effort on curriculum development and expansion. A lack of digital literacy not only hinders individuals from fully benefiting from digital services but also increases their vulnerability to fraud, hacking, and misinformation. A report by the International Telecommunication Union (ITU, 2021) revealed that only 15% of countries have at least 10% of their population possessing advanced digital skills. Moreover, Xiong and Zuo (2019) emphasized that socio-cultural activities involving friends and family could improve the technological capabilities of the elderly and disadvantaged groups. To bridge the digital divide, it is imperative to launch more capacity-building programs, starting in schools and extending to the elderly, across different contexts, nations, and demographics (Abdallah et al, 2023).

Educational systems and individual schools, facing complex administrative structures and performance expectations, are increasingly operating like commercial enterprises. The success of these institutions, including student achievements, depends on school leadership. However, there’s uncertainty regarding whether school administrators possess the necessary management skills, leadership philosophies, and styles to ensure efficient operational effectiveness (Abdallah et al, 2023). As schools resemble business organizations, they could benefit from leadership philosophies proven to enhance performance in both corporate and educational environments. Educational leadership may profit from training and development in transformational leadership techniques known to boost performance in the corporate sector (Anderson, 2017).

In transforming education through technology, the question is not whether technology should be used in classrooms, but how it should be utilized. Access to computers, mobile devices, and the internet can extend learning beyond the traditional classroom and school day, which can enhance teacher quality. Research indicates that ongoing, job-integrated professional development, access to online resources, and virtual communities of practice significantly impact teacher quality. Technology enables diagnostic, timely, and innovative assessments (Wellings & Levine, 2009). David and Abukari (2020) highlighted that in the United Arab Emirates, there is a strong interest in raising standards for school leader recruitment, incorporating experts, continual professional development, and integrating modern technology in the development of school leaders. The significance of mentorship approaches, along with the necessary qualifications, skills, and knowledge, was also emphasized in these studies.

## **FOSTERING EDUCATION AND LIFELONG LEARNING**

Endres et al. (2020) observed that the foundation of how students typically learned was established early in their academic careers. They found that many students did not rely on learning techniques that were most effective from a scientific perspective. Schwartz et al. (2018) noted that millennials might find

formal lectures and traditional education techniques to be unengaging and dull. In response to a decline in formal live lecture attendance, numerous programs have shortened didactic programs, reassessed the value of their content, and explored alternative methods of information delivery using recent technologies. They discovered that while in-person attendance remained the most common way for students to access live lectures, video lectures were equally beneficial.

The primary factor influencing students' choices to attend lectures in person or watch recorded sessions is their desire to achieve personal professional goals. Educators face the ongoing challenge of integrating technologies that students find useful, while also fostering a collaborative learning environment. Students from the millennial generation view effective teachers as those who embrace technology and adopt new teaching strategies (Abdallah & Farhan, 2023). Education professionals can employ shorter, more interactive, and digestible segments of teaching as effective learning tactics. Combining various technologies can help minimize disruptions and enhance the learning experience. Examples include audience response systems for immediate feedback and online resources (Alkaabi & Almaamari, 2020). Independent learning activities also play a crucial role in encouraging students to take charge of their educational journey, which fosters lifelong learning habits beyond formal education.

However, comprehensive studies summarizing effective professional development and school leadership theories are limited. Recent research primarily focuses on transformational and educational leadership. A review of leadership theories indicates that educational leadership strongly emphasizes the instruction and learning processes, the cornerstones of education. Meanwhile, transformational leadership concentrates on inspiring individuals to work towards the goals of the educational institution. The concept of distributed leadership has also emerged, which suggests that educational leadership responsibilities are shared among various individuals (Daniels et al., 2019).

Integrating technology in education is essential in facilitating and sustaining learning under various circumstances, thereby promoting sustainable education despite external or internal challenges like the COVID-19 pandemic or natural disasters. Technology serves as an educational tool that supports and ensures learning quality. To sustain learning, introducing technology that meets market and global demands is crucial (Thangeda & Baratiseng, 2016). Additionally, technology in education plays a key role in raising awareness of environmental sustainability, thereby strengthening the economy (Daniela et al., 2018).

Schols (2012) and Franciosi (2012) both emphasized the significance of transformational leadership in promoting education and lifelong learning through technology integration. Schols (2012) specifically highlighted the role of transformative learning theory in professional development for educators in technology, while Franciosi (2012) advocated for a flexible, democratized leadership style to adapt to technological changes. Todd (1999) underscored the complexity of developing teaching strategies to address information literacy and World Wide Web usage. Roth (2016) offered a comprehensive framework for education transformation, including the pivotal role of leadership in successful technology implementation. These studies collectively underscored the necessity of transformational leadership in effectively utilizing technology in education (Darawsheh et al., 2023).

## **THE FUTURE OF EDUCATION**

The COVID-19 pandemic notably accelerated educational trends and necessitated the adoption of innovative technologies and approaches to teaching and learning. During lockdowns, online learning

## ***Transforming Education Through Technology and School Leadership***

became a crucial conduit for continuing education, and it prompted countries worldwide to enhance their technological infrastructure to meet learners' diverse needs (Turnbull et al., 2021). Governments and educational sectors urgently sought innovative solutions to maintain education while adhering to social distancing measures. Zhao and Watterston (2021) highlighted that the pandemic's global impact spurred collaborative efforts to find shared solutions. Consequently, the shift to e-learning catalyzed significant transformations in key educational aspects, such as curriculum, pedagogy, teaching, learning, and assessment (Zhao & Watterston, 2021). This transition to remote learning has reshaped systems, with certain remote and hybrid approaches likely to continue (Neuwirth & Mukherji, 2021). Digital devices and platforms have become integral in classrooms and facilitate interactive student engagement.

The current technological trends not only shape the present but also have profound implications for the future of education. Future trends are geared towards immersing students in learning experiences using Gamification, Virtual Reality (VR), and Augmented Reality (AR). Anggara et al. (2021) noted that such tools could enhance learners' curiosity and concentration and created a motivational and exploratory learning environment. Giannakos et al. (2020) discussed the growing appeal of game-based learning, which offers engaging opportunities that boost student motivation and academic achievement. To prepare learners for their future, educators should incorporate game-playing elements that include Artificial Intelligence (AI) and Machine Intelligence (MI), as these technologies are shaping the future world. Luan et al. (2020) explored how AI's evolution, along with the widespread use of e-learning, social media, and digital platforms, has contributed to a substantial database. This database aids educators in crafting personalized learning programs and bespoke assessment tools that enrich educational experiences (Luan et al., 2020).

Educational leaders must, therefore, advocate for the effective integration of technology into learning (Christensen et al., 2018). School leaders should establish a unified vision for technology integration, develop technology usage policies, and provide high-quality resources for successful classroom implementation (Christensen et al., 2018). Prioritizing investment in technological resources, particularly in Information and Communication Technologies (ICT), is essential as they foster creative, integrative, and evaluative learning experiences (Christensen et al., 2018). Furthermore, AI technologies are stimulating further educational research through innovative data collection and analysis techniques (Luan et al., 2020). Educational leaders should conduct a comprehensive review of curriculum alignment, pedagogy, assessment and feedback, and infrastructure and resources (Almaktoum & Alkaabi, 2024). Zhao and Watterston (2021) emphasized the importance of involving learners in curriculum development to ensure it meets their needs to prepare them for the modern era (Abdallah & Abdallah, 2023).

As technology permeates all societal aspects, it has transformed education and made it more accessible, engaging, and tailored to learners' needs (Raja & Nagasubramani, 2018). However, challenges such as equitable access, academic integrity, and privacy and security concerns must be addressed (Al-Zoubi et al., 2024; Christensen et al., 2018). Educators should remember that technology is a tool and carefully monitor its access and usage to ensure it enhances learning experiences. In the realm of cybersecurity and digital awareness, school leaders have a critical role. Kritzinger (2017) emphasized the necessity of establishing a cyber-safety culture in schools, a task that requires the leadership and initiative of school administrators. Corradini (2020) also highlighted the importance of fostering digital awareness from an early age, with school leaders being instrumental in implementing interventions that promote responsible digital technology usage. However, Lindqvist (2019) pointed out the complexities of this role, as leaders must adeptly handle technical, pedagogical, administrative, and organizational challenges in the digital era. To effectively navigate these challenges, Lorenz (2016) suggested a model



for assessing digital safety concerns in educational settings. This model can aid in the implementation of internet security training and other activities aimed at enhancing the cyber safety skills of both students and teachers (Abdallah, 2023).

## **CONCLUSION**

The digital age has fundamentally reshaped education and cast school leaders as the architects of this transformative journey. Embracing the potential of technology, they must critically assess both its advantages and risks to cultivate an educational system centered around students, connected on a global scale, and adaptable to evolving needs. Through data-driven insights, leaders can make informed choices to enhance student outcomes and optimize resource allocation. Personalized learning, supported by adaptive technologies, offers tailored educational pathways, but its success relies heavily on robust leadership backing and comprehensive educator training. Ensuring digital equality is imperative for granting all students equitable access to education. The COVID-19 pandemic accelerated e-learning, fostering global collaboration and propelling education toward a future enriched with immersive experiences, gamification, and artificial intelligence. School leaders have an indispensable role in integrating technology while safeguarding cybersecurity and digital safety, which encompasses the cultivation of a responsible digital culture and effective responses to cybersecurity incidents.

The future of education hinges on leaders' proficiency in navigating the digital landscape, making data-driven decisions, advocating for personalized learning, upholding equity, and ensuring cybersecurity. Adapting to technological advancements is vital in preparing students for forthcoming challenges. At the heart of transformational leadership and learning is the empowerment of learners with skills essential in an information and technology-driven society. Devising effective instructional strategies to target these skills is a demanding and time-intensive endeavor. Nonetheless, mastering these competencies leads to enriching educational opportunities and fruitful learning outcomes, which poses a significant leadership challenge in the years to come (Todd, 1999). Further research is necessary to furnish policymakers and leaders with guidelines on steering education amid technological applications and leadership approaches.

The rapid shifts in the educational landscape, the pursuit of elevated educational standards, and the demand for quality education have heightened the requisites for teacher skills and professionalism. Teachers have raised their own expectations as new modes of thinking and educational innovations intensify in the knowledge society. Continuous learning is necessary for teachers, and it necessitates exposure to new knowledge, substantial support, and access to novel opportunities and technologies. Policies advocating for the deepening of teachers' knowledge and practice aim to elevate educational outcomes and academic performance. Teacher professional development plays a pivotal role in enhancing student learning and achievement and demands collaboration among educational institutions, leaders, faculty, and teaching staff (Sancar et al., 2021). Shagrir (2017) as well as Al-Zoubi et al. (2023) underscored that collaboration was a fundamental aspect of academic and professional development. This raises questions regarding the nature of collaborations, preferred partners, methods employed, benefits, and the pivotal role of educational organizations and leaders in nurturing such collaborations. As Sancar et al. (2021) emphasized, the enhancement of student outcomes was reliant on ongoing professional development for educators, and it evolved throughout a teacher's career and benefitted from teacher-education leader collaborations.

Furthermore, school leaders should empower educators by fostering “agile leaders of learning,” individuals adept at navigating complexity and responding innovatively in collaboration with peers. Agile leadership in education underscores the importance of collective decision-making involving teachers, students, and other stakeholders. For example, a teacher might engage students in classroom management or educational decisions, or collaborate with colleagues to share knowledge and resources. This approach fosters shared responsibility and accountability, which leads to more effective and sustainable educational strategies. In summary, the rapidly evolving digital age necessitates that school leaders excel in guiding change, leveraging technology, promoting personalized learning, ensuring equity, and upholding cybersecurity. The imperative for continuous teacher professional development, collaboration, and cultivating agile leadership is central to achieving professional growth and student success in the dynamic educational landscape.

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# Chapter 14

## Promoting Responsible AI Practices: Legal Responsibilities of Teachers for Students With Special Needs in the United Arab Emirates

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### ABSTRACT

*This research delves into responsible AI practices in UAE education, specifically focusing on the legal responsibilities of educators working with students who have special needs. With AI technologies evolving and reshaping education, it's crucial to examine the legal framework and educators' duties. The primary objective is to comprehensively analyze the legal landscape in the UAE, encompassing education regulations and policies. Through this thorough exploration, the research aims to provide valuable insights and practical recommendations for promoting responsible AI practices in special education. Ultimately, the findings are intended to guide educators in navigating their legal responsibilities and ethical considerations while seamlessly integrating AI technologies for the benefit of special needs students in the United Arab Emirates.*

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## INTRODUCTION

This study is dedicated to examining the legal responsibilities of teachers who work with students with special needs in the United Arab Emirates (UAE) within the context of education in the age of artificial intelligence (AI). As AI technologies continue to evolve and reshape the educational landscape, there is a pressing need to explore the legal framework that governs their utilization and the specific obligations imposed on educators. The research's primary objective is to conduct a thorough investigation into the legal considerations and duties that educators must navigate when integrating AI into educational environments, with a particular emphasis on students with special needs.

By undertaking a meticulous analysis of the legal landscape within the UAE, encompassing relevant statutes, regulations, and educational policies, this study seeks to provide invaluable insights into the promotion of responsible AI practices within the realm of special education. Ultimately, the research findings aim to offer educators a clear roadmap for fulfilling their legal responsibilities and ensuring the ethical and effective integration of AI technologies to enhance the educational experience of students with special needs in the United Arab Emirates.

## THE IMPORTANCE OF STUDYING

**Understanding Legal Framework:** Studying is essential for teachers to comprehend the legal framework that governs the use of artificial intelligence (AI) in education, especially concerning students with special needs. This understanding is vital for ensuring compliance with UAE's laws and regulations in the context of AI integration.

**Awareness of Legal Responsibilities:** Through study, teachers can gain insights into their legal responsibilities when using AI technologies in the classroom. This knowledge is fundamental for educators to operate within the bounds of the law and uphold ethical standards.

**Effective Implementation:** In-depth study enables educators to make informed decisions when integrating AI into their teaching methods. They can identify best practices, potential legal pitfalls, and strategies for ensuring AI benefits students with special needs.

**Ethical Considerations:** Studying helps teachers appreciate the ethical implications of AI in special education. It allows them to assess how AI impacts students' learning experiences, privacy, and individualized support, ensuring responsible AI practices.

**Continuous Improvement:** The field of AI is dynamic, and constant study is necessary for teachers to stay updated with the latest developments, legal changes, and emerging ethical concerns related to AI in education.

**Student Advocacy:** Studying empowers teachers to advocate for students with special needs effectively. They can use their knowledge to ensure that AI technologies are implemented in a way that genuinely benefits these students, promoting inclusivity and equal opportunities.

**Compliance and Accountability:** Knowledge gained through studying ensures that teachers are aware of their legal obligations and are accountable for their actions when implementing AI. This can help prevent potential legal issues and ensure responsible AI practices.

**Enhancing Educational Outcomes:** By continuously studying AI and its legal implications, teachers can improve their ability to leverage AI tools to enhance the educational experiences and outcomes of students with special needs (Abdallag et al,2023).

## ***Promoting Responsible AI Practices***

In essence, studying is not just a means of personal development but a critical prerequisite for teachers to fulfill their legal responsibilities and promote responsible AI practices when working with students with special needs in the United Arab Emirates. It equips educators with the knowledge and tools needed to navigate the complex intersection of AI, education, and legal compliance while prioritizing the well-being and progress of their students (Abdallah & Alkaabi,2023).

## **STUDY PROBLEM**

the study problem revolves around the complex and evolving landscape of AI in education, with a specific focus on the legal responsibilities of teachers working with students with special needs in the UAE. It seeks to address the challenges, opportunities, and ethical considerations inherent in this intersection.

## **STUDY QUESTIONS**

- What is the current state of artificial intelligence (AI) integration in educational settings for students with special needs in the United Arab Emirates (UAE)?
- What are the key legal frameworks, including laws, regulations, and policies, that govern the use of AI in UAE's educational institutions, especially in the context of students with special needs?
- What are the specific legal responsibilities and obligations placed on teachers in the UAE when implementing AI technologies and practices in their classrooms for students with special needs?
- How do teachers perceive their legal responsibilities and ethical obligations regarding the integration of AI in special education in the UAE?
- What are the ethical considerations associated with AI integration in special education, and how do these align with or differ from the legal requirements in the UAE?
- To what extent do teachers in the UAE receive training and professional development on AI technologies and their legal implications in the context of special education?
- What are the challenges and barriers that teachers encounter in fulfilling their legal responsibilities related to AI integration in special education, and how can these challenges be addressed?
- What impact does the legal landscape and teachers' compliance with legal responsibilities have on the educational quality and inclusivity of special education programs in the UAE?
- How can responsible AI practices be promoted and encouraged among teachers and educational institutions in the UAE to ensure the ethical and effective use of AI technologies for students with special needs?
- What recommendations can be made for policymakers, educational authorities, and teacher training programs in the UAE to enhance the understanding and implementation of legal responsibilities and ethical considerations related to AI in special education?

## **OBJECTIVES OF THE STUDY**

This research aims to address the critical intersection of artificial intelligence (AI) integration in UAE's educational settings, particularly focusing on students with special needs (Abdalla et al., 2023). The study

seeks to provide insights into the current state of AI integration and the associated legal responsibilities and ethical considerations faced by educators. Two primary axes guide this inquiry:

- **Evaluate AI implementation in UAE educational settings for special needs students.**
- **To investigate how teachers perceive and understand their legal responsibilities and ethical obligations concerning AI integration in special education in the UAE.**

## **Evaluate AI Implementation in UAE Educational Settings for Special Needs Students**

The integration of artificial intelligence (AI) into educational environments marks a pivotal juncture in the evolution of special education (Alhumaid, Naqbi, ElSORI, & Mansoori, 2023) in the United Arab Emirates (UAE)(Enas Mohammed Alqodsi & Aljahoori, 2023). In an era where technological advancements are rapidly shaping the educational landscape, understanding the current state of AI implementation for students with special needs(Alhusaini, Eissa, Saad, Beiram, & Sadek, 2022) is paramount. This evaluation seeks to illuminate the extent to which AI technologies have been incorporated into educational settings dedicated to special students' needs within the UAE(Tapalova & Zhiyenbayeva, 2022).

AI holds the potential to revolutionize the way special education is delivered, offering personalized learning experiences, tailored support, and innovative tools to enhance the educational journey of students with diverse needs. However, to harness these transformative benefits, it is imperative to comprehensively assess the present landscape of AI integration in UAE's educational institutions(Tapalova & Zhiyenbayeva, 2022).

Through this evaluation, we embark on a journey to delve into the status quo of AI implementation, exploring the strategies, technologies, and initiatives that are currently in place to support the special needs of students. By gaining insights into the level of AI incorporation, we aim to paint a vivid picture of the opportunities, challenges, and areas for improvement in this crucial intersection of technology and education.

As we embark on this exploration, our ultimate goal is to provide a nuanced understanding of AI's role in UAE's special education landscape, thereby paving the way for informed decisions, responsible practices, and enhanced educational outcomes for students with special needs(Thurzo, Strunga, Urban, Surovková, & Afrashtehfar, 2023).

## **TOPICS UNDER CONSIDERATION**

### **Current AI Integration in Special Education**

An in-depth analysis of the existing AI technologies and practices employed within UAE's educational institutions catering to students with special needs. This topic will provide a comprehensive overview of the current state of AI integration.

**AI Integration in UAE Education:** The UAE has been actively embracing AI and technology in various sectors, including education. In recent years, there has been a growing interest in utilizing AI to

## ***Promoting Responsible AI Practices***

enhance the education system, including special education. AI applications in education (Al Dayseh, 2023) can range from personalized learning platforms to assistive technologies for students with special needs (Halaweh, 2018).

**Personalized Learning:** AI-powered platforms and tools can adapt to the individual needs and learning styles of students, including those with special needs. These systems can analyze students' strengths and weaknesses, offering tailored content and exercises to maximize their learning outcomes (Belkhouche & Ismail, 2016).

**Assistive Technologies:** AI-driven assistive technologies have the potential to significantly benefit students with special needs (Flanagan, Bouck, & Richardson, 2013). These technologies can include speech recognition software, text-to-speech applications, and communication aids, making it easier for students with disabilities to access and engage with educational content (Burne, Knafelc, Melonis, & Heyn, 2011).

**Early Intervention:** AI can be used to identify learning disabilities or special needs (Alghamdi, 2022) in students at an earlier stage, allowing for timely interventions and support. Machine learning algorithms can analyze students' performance and behavior to detect patterns that may indicate the need for special education services.

**Data-Driven Decision-Making:** AI can help educators and policymakers make data-driven decisions to improve the quality of special education (Nam, Bahn, & Lee, 2013). By analyzing large datasets, AI can identify trends, evaluate the effectiveness of interventions, and inform policy changes (Badawy & Alkaabi, 2023; Khalil et al., 2023; Ismail et al, 2023).

**Challenges and Concerns:** While AI integration in special education offers numerous benefits, there are also challenges and concerns (Alcorn et al., 2019). These include data privacy issues, ensuring that AI tools are accessible to all students, and addressing the potential for bias in AI algorithms that could impact students with disabilities.

**Legal and Ethical Considerations:** The UAE, like other countries, has legal and ethical considerations when it comes to AI use in education (Ghandour & Woodford, 2019). Educators and policymakers need to navigate these frameworks to ensure responsible AI practices, especially when it comes to students with special needs.

**Teacher Training:** To effectively integrate AI into special education, teachers need training and professional development. Ensuring that educators are well-prepared to use AI tools and support students with special needs is crucial. Professional development can not only introduce new instructional practices to educators but also equip them with the necessary knowledge about prevalent issues in education (Alkaabi, 2023; Alkaabi et al., 2023; Alkaabi, 2021; Almaktoom & Alkaabi, 2024; Alkaabi & Almaamari, 2020).

**Collaboration and Research:** Collaboration between educational institutions, government agencies, and technology companies is essential for successful AI integration (Stephenson, Dada, & Harold, 2012). Ongoing research and evaluation of AI applications in special education are also necessary to measure their impact and refine practices (Ibrahim, 2020).

**Future Directions:** The UAE's commitment to innovation suggests that AI integration in special education will continue to evolve. This could involve greater use of AI-driven assistive technologies, expanded teacher training programs, and policy development to ensure ethical and responsible AI practices (Chandra, Sharma, & Liaqat, 2019).

## Challenges and Opportunities

An exploration of the challenges faced and opportunities presented by AI integration in special education within the UAE(Miao, Holmes, Huang, & Zhang, 2021). This topic will delve into the potential benefits and hurdles encountered in harnessing AI for the benefit of students with diverse needs(Afari & Khine, 2017).

### Challenges

**Accessibility:** One of the significant challenges in AI integration in special education is ensuring accessibility for all students. While AI can offer personalized learning experiences(issa Hassan, 2021), it's essential to ensure that these technologies are usable and beneficial for students with diverse needs, including those with disabilities(Alzahrani, 2022). This might require adaptations, such as specialized interfaces or assistive technologies.

**Data Privacy:** AI applications often rely on collecting and analyzing student data to provide personalized support (Waladi, Khaldi, & Sefian, 2023). Ensuring the privacy and security of sensitive student information is crucial(El-Masry, 2022). Schools and institutions must comply with data protection regulations to safeguard students' personal data (Abdallah & Alkaabi,2023).

**Equity:** There's a risk that AI integration could exacerbate existing educational inequalities. Students from disadvantaged backgrounds or with fewer resources may have limited access to AI-powered tools and platforms. Ensuring equitable access and opportunities for all students is a significant challenge(H. Lee & Templeton, 2008).

**Bias and Fairness:** AI algorithms can unintentionally incorporate biases present in training data, potentially leading to unfair outcomes, particularly for minority or marginalized students. It's crucial to monitor and mitigate bias in AI systems to ensure that they don't discriminate against certain groups of students(I. Lee, Ali, Zhang, DiPaola, & Breazeal, 2021).

**Teacher Training:** Integrating AI into special education requires teachers to adapt to new technologies and teaching methods. Providing adequate training and professional development opportunities for educators is a challenge that needs to be addressed to ensure that teachers can effectively leverage AI tools(E. Alqodsi, 2023).

**Ethical Considerations:** As AI becomes more integrated into education, ethical questions arise. Educators and policymakers must grapple with issues related to student autonomy, surveillance, and the appropriate use of AI. Striking the right balance between enhancing learning and protecting student rights is a complex challenge(Berendt, Littlejohn, & Blakemore, 2020).

### Opportunities

**Personalized Learning:** AI enables the creation of personalized learning pathways for students with special needs(D. Lee, Huh, Lin, & Reigeluth, 2018). These technologies can adapt to individual learning styles, preferences, and paces, offering tailored content and support.

**Early Intervention:** AI can assist in the early identification of learning disabilities or special needs, enabling timely interventions. Early support can significantly improve outcomes for students with diverse needs(Ortiz et al., 2011).

## ***Promoting Responsible AI Practices***

**Assistive Technologies:** AI-powered assistive technologies, such as speech recognition and text-to-speech tools, can enhance accessibility for students with disabilities. These technologies can level the playing field, allowing students to engage with educational content more effectively (Zdravkova, 2022).

**Data-Driven Insights:** AI can analyze large datasets to provide valuable insights for educators and policymakers. This data-driven approach can inform decision-making, helping to identify effective teaching methods and areas where additional support is needed (Yu, Feng, & Tesic, 2023).

**Inclusivity:** AI has the potential to make education more inclusive. By providing personalized support, adaptive content, and accessibility features, AI can cater to a broader range of student needs and abilities (Darawsheh et al, 2023).

**Research and Innovation:** AI integration in special education encourages research and innovation in the field. This fosters collaboration between educators, researchers, and technology developers to continually improve educational practices (Jandigulov et al., 2023).

AI integration in special education in the UAE offers significant potential benefits, including personalized learning, early intervention, and improved accessibility. However, it also presents challenges related to equity, data privacy, and ethical considerations. Addressing these challenges while maximizing the opportunities can lead to more inclusive and effective education for students with diverse needs in the UAE. Ongoing research and collaboration will play a crucial role in shaping the future of AI in the educational experience for students with special needs (Abdallah et al, 2023).

## **HOW TEACHERS PERCEIVE AND UNDERSTAND THEIR LEGAL RESPONSIBILITIES AND ETHICAL OBLIGATIONS CONCERNING AI INTEGRATION FOR STUDENTS WITH SPECIAL NEEDS**

In the context of special education in the United Arab Emirates (UAE), it is paramount to investigate how educators perceive and interpret their legal responsibilities (Al-Serhan, 2022) and ethical duties concerning the integration of artificial intelligence (AI). Special education, designed to cater to individuals with diverse and unique needs, often necessitates innovative approaches to teaching and support. AI technologies have emerged as potent tools in this endeavor, offering the potential to enhance the educational experience for students with special needs.

Understanding teachers' viewpoints in the UAE regarding AI integration is pivotal in ensuring that technology is harnessed responsibly and ethically. Here, we delve into the core aspects of this exploration:

### **Teacher Awareness of Legal Responsibilities**

In this section, we will provide a comprehensive analysis of the extent to which teachers in the United Arab Emirates (UAE) are informed about their legal responsibilities (Jadalhaq & Alqodsi, 2021) in relation to the integration of artificial intelligence (AI) into special education. We will closely examine their awareness of the existing legal framework, which encompasses UAE laws (El Maknouzi, Jadalhaq, Abdulhay, & Alqodsi, 2023), regulations, and educational policies that pertain to the utilization of AI within educational settings, particularly when catering to students with special needs.

In accordance with UAE laws, it is essential to consider the specific regulations and policies that govern the implementation of AI technologies in educational contexts. UAE legislation may include

provisions related to data privacy, accessibility, ethics, and the rights of students with special needs. We will explore whether teachers are acquainted with these legal requirements and how they interpret and internalize them (Abdallah & Alkhrabsheh, 2019). Achieving a comprehensive understanding of teachers' legal responsibilities (Enas Mohammad Alqodsi, Jadalhaq, & El, 2023) in the context of AI integration for special education in the United Arab Emirates (UAE) involves considering several key factors:

**Federal Law No. 29 of 2006**, focused on safeguarding the rights of individuals with disabilities, represents a groundbreaking legislative stride in the United Arab Emirates (UAE). Notably, Article 12 of this pivotal law underscores the nation's commitment to affording individuals of determination equal access to education. This entails the provision of educational opportunities within standard classrooms, as well as specialized classes tailored to their specific needs. The law further emphasizes the availability of adapted curricula, including formats like sign language or Braille, to facilitate effective learning (Lawson, 2006).

Aligned with this legal framework, the Ministry of Education (MoE) has embarked on a strategic mission to transform public schools into inclusive educational environments, ensuring accessibility for individuals of determination. As part of this visionary approach, individuals of determination are granted the right to enroll in any school of their choice, without exception. To oversee and champion the educational interests of these students, the Department of Special Education was established in 2008 under the MoE's auspices. This department plays a pivotal role in advocating for the rights of individuals of determination, ensuring their equitable access to educational opportunities mirroring those offered to their peers in mainstream education (Jamil, Razak, Raju, & Mohamed, 2011).

Education stands as one of the core pillars of this overarching strategy. The government is steadfast in its commitment to establishing an integrated education system that seamlessly incorporates individuals of determination into both public and vocational educational settings. This endeavor encompasses the adaptation of school curricula to align with their unique needs, the deployment of highly qualified educators and specialists, the provision of assistive technologies, and the availability of tailored learning materials. Through these concerted efforts, the UAE is unwavering in its dedication to empowering individuals of determination and fostering an inclusive educational landscape (Ibrahim & Aljneibi, 2022).

The United Arab Emirates (UAE) has taken significant steps to promote the inclusion of individuals with disabilities in mainstream education. These efforts are exemplified in Ministerial Resolution No. 647 of 2020, which outlines the policy of inclusive education. This resolution mandates that government schools must adapt to meet the unique needs of individuals with disabilities, ensuring they receive high-quality education services (Dukmak, Gharaibeh, Alkhatib, & Ijha, 2023).

Furthermore, the UAE Ministry of Education established the People of Determination Department (formerly known as the Special Education Department) in 2008. This department is dedicated to safeguarding the rights of students with disabilities and providing them with equal opportunities in education. Notably, the ministry offers a range of support services, all provided free of charge in government schools.

The ministry is committed to equipping specialized teachers with advanced skills in behavior management, enabling them to effectively support individuals with disabilities. Various skill training programs have been introduced, addressing topics such as working with individuals who have visual or hearing impairments. These programs also focus on talent identification, proficiency in sign language for those with hearing difficulties, and strategies for addressing language disorders in children (Reimers, 2020).

Across the UAE, support centers have been established to monitor the progress of students with disabilities, both before and after their inclusion in regular schools. These centers offer a wide array of services, including diagnosing students with disabilities and learning difficulties, providing recommen-

## ***Promoting Responsible AI Practices***

dations, assisting parents in understanding and addressing their child's condition, and recommending suitable support services.

The UAE mandates that schools provide several facilities and resources to accommodate students with disabilities. These include wheelchair ramps, elevators, adapted toilets, accessible transportation, and parking spaces for individuals with physical disabilities. Special education resource rooms and sensory and comprehensive rooms are also designated spaces to aid in the learning process. Additionally, a specialized team of professionals, including special education teachers, teacher assistants, escorts, sign language interpreters, Braille education specialists, visual impairment specialists, psychologists, speech and language specialists, and special education specialists, is made available to support students.

A multidisciplinary team is responsible for assessing and diagnosing the needs of students with disabilities. Individualized and group treatment and rehabilitation sessions are provided as required, covering areas such as speech and language therapy, Braille education, behavior modification, and sign language.

The ministry offers counseling, awareness, and guidance sessions for parents of students with disabilities. It also ensures that students receive assistive technologies tailored to their specific needs. Workshops and courses are conducted for administrative staff, teachers, specialists, and parents of students, with a focus on enhancing support and understanding (Abdallah et al, 2023)

Importantly, students with disabilities are actively encouraged to participate in various activities organized by the ministry, including awards ceremonies, competitions, and programs both within and outside the UAE, such as the "Our Ambassadors" program.

## **Ethical Considerations in AI Integration**

This section will center on the ethical responsibilities of educators regarding the integration of AI technology in special education within the UAE. Our aim is to gain insight into how educators perceive ethical principles within the context of utilizing AI tools and technologies. This encompasses an exploration of their viewpoints on issues such as student privacy, data security, and the potential impact of AI on students' well-being. Additionally, we will delve into whether educators feel a moral obligation to promote the responsible and equitable utilization of AI in special education and how they put these ethical principles into action (Abdallah& Musah, 2023).

When delving into the ethical considerations surrounding the convergence of artificial intelligence (AI) and the right to education for individuals with special needs, it is crucial to acknowledge the profound influence such technology can exert on both individuals and society as a whole. Here, **we outline several critical ethical considerations for educators operating in this context:**

**Equity and Inclusion:** AI technologies should be deployed in a manner that advances fairness and inclusivity. Educators must ensure that AI tools do not exacerbate existing inequalities or discriminate against students with special needs. It is imperative to provide equal access and opportunities for all learners, irrespective of their abilities or disabilities(Ahmad, Tariq, Hussain, & Gill, 2023).

**Data Privacy and Security:** AI systems frequently amass and scrutinize extensive data, including sensitive student information. Educators must accord paramount importance to data privacy and security to safeguard the personal data of students with special needs. They should be well-versed in data protection regulations and guarantee that AI platforms adhere to these legal requirements (Abdallah,2023).



**Transparency and Accountability:** Educators should possess a clear comprehension of how AI algorithms operate and make decisions. They need to ensure that AI systems are transparent and accountable, especially when these technologies are employed to formulate educational recommendations or decisions that impact students' educational trajectories (Abdallah & Farhan, 2023).

**Informed Consent:** In certain situations, AI systems may necessitate the collection of data from students with special needs. Educators should obtain informed consent from both students and their parents or guardians. This should involve an explanation of how data will be utilized and ensuring that individuals comprehend the implications of data sharing (Musah et al., 2023).

**Bias and Fairness:** AI algorithms may inadvertently perpetuate biases inherent in their training data. Educators must remain vigilant in identifying and mitigating biases within AI systems to secure equitable treatment and opportunities for all students.

**Ethical Use of AI in Assessment:** When AI is employed to evaluate students' progress or capabilities, educators should consider the ethical implications. They should guarantee that AI assessments are valid, reliable, and aligned with educational objectives, while avoiding stigmatization or unjust labeling of students with special needs (McDonald & Pan, 2020).

**Human-AI Collaboration:** Ethical integration of AI frequently necessitates a collaborative approach between educators and AI systems. Educators must strike a balance between relying on AI for valuable insights and maintaining their roles as educators, mentors, and advocates for students with special needs (Abdallah & Abdallah, 2023).

**Continuous Learning and Adaptation:** AI technologies evolve rapidly. Educators must commit to continuous professional development to stay updated on the latest ethical guidelines, best practices, and potential risks associated with AI integration in special education (Abdallah et al., 2023).

**Empowerment and Autonomy:** Educators should empower students with special needs to comprehend and govern AI technologies utilized in their education. Granting students agency over AI tools can enhance their educational experience and encourage self-advocacy (Tsai, Perrotta, & Gašević, 2020).

**Ethical Decision-Making:** Educators should be prepared to make ethically sound decisions when confronted with complex ethical dilemmas posed by AI systems. This encompasses taking into account the best interests of students and upholding their right to a quality education (Ehrich, Kimber, Millwater, & Cranston, 2011).

In conclusion, ethical considerations pertaining to AI integration in special education within the UAE encompass a wide range of facets, including equity, data privacy, transparency, fairness, and the responsible utilization of technology to enhance the educational journey of individuals with special needs. Educators play a pivotal role in navigating these ethical challenges, ensuring that AI contributes positively to the right to education for all students (Ramdan & Ismail, 2023; Abdallah & Alriyami, 2022).

## **CONCLUSION**

In the dynamic landscape of education in the United Arab Emirates, the integration of artificial intelligence (AI) holds immense promise for students with special needs. This exploration has delved into the legal responsibilities of teachers in ensuring the responsible use of AI to fulfill the right to education for people with special needs.

## ***Promoting Responsible AI Practices***

Through an in-depth analysis of UAE laws, regulations, and policies, we have unveiled a robust legal framework that underscores the government's commitment to inclusivity and equal access to education. Federal Law No. 29 of 2006 is the cornerstone, mandating equal opportunities for people with disabilities in education and underpinning a commitment to accessible curricula, resources, and facilities.

Moreover, we've examined the ethical considerations that come to the forefront when AI intersects with the right to education for individuals with special needs. Educators play a pivotal role in navigating these ethical complexities, ensuring that AI is harnessed responsibly, fairly, and equitably.

## **RECOMMENDATIONS**

1. **Ongoing Teacher Training:** The Ministry of Education should prioritize continuous training and professional development for teachers, specifically focusing on the ethical and legal dimensions of AI integration in special education. Equipping educators with the knowledge and skills necessary to navigate these complex areas is essential.
2. **Awareness Campaigns:** The government and educational authorities should launch awareness campaigns aimed at both educators and parents to foster a comprehensive understanding of the legal and ethical aspects of AI in special education. This can help in building a collective commitment to responsible AI practices.
3. **Clear Ethical Guidelines:** Educational institutions should establish clear and comprehensive ethical guidelines for the integration of AI in special education. These guidelines should cover issues related to data privacy, transparency, and fairness, among others.
4. **Collaboration and Monitoring:** Encouraging collaboration between educators, specialists, and AI developers can help create AI solutions tailored to the needs of students with special needs. Additionally, a monitoring mechanism should be established to ensure compliance with legal requirements and ethical standards.
5. **Student Empowerment:** Students with special needs should be educated about AI technologies and their rights. Promoting their understanding and agency over AI tools can contribute to a more inclusive and empowering educational experience.
6. **Research and Innovation:** Encouraging research and innovation in the field of AI for special education can lead to the development of more effective and ethically sound solutions. Funding and support for such endeavors can drive progress in the sector.

In conclusion, the integration of AI in special education is a transformative step forward, holding the potential to revolutionize the educational experiences of students with special needs in the UAE. However, to realize this potential, it is imperative that educators, policymakers, and stakeholders work collaboratively to ensure the responsible, equitable, and ethical use of AI technologies, thereby upholding the right to education for all.

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# Chapter 15

## Navigating the Legal Landscape: AI Adoption in Education and Teacher Responsibilities

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### ABSTRACT

*This research delves into the legal implications surrounding the adoption of artificial intelligence (AI) in the field of education and explores the corresponding responsibilities of teachers. As AI continues to shape the educational landscape, it becomes crucial to understand and navigate the legal framework governing its implementation. The study examines the legal challenges and considerations that arise when integrating AI technologies in educational settings and specifically focuses on the responsibilities that teachers bear in this context. By examining relevant laws, regulations, and policies, the research aims to provide valuable insights into the legal landscape of AI adoption in education and assist teachers in fulfilling their obligations while leveraging AI technologies responsibly.*

### INTRODUCTION

The United Arab Emirates (UAE) is at the forefront of embracing technological advancements, and the field of education is witnessing the transformative impact of Artificial Intelligence (AI). As AI technologies continue to shape the educational landscape, it is imperative to navigate the legal framework

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## ***Navigating the Legal Landscape***

governing their adoption in accordance with UAE laws(Chan, 2023). This research delves into the legal implications surrounding the integration of AI in the UAE's educational domain and explores the specific responsibilities that teachers bear in this rapidly evolving context, The UAE's visionary leadership recognizes the potential of AI to revolutionize education by enhancing learning outcomes(Kadaruddin, 2023), promoting personalized instruction, and streamlining administrative processes. However, with these opportunities come legal challenges that require careful examination and adherence to the country's regulatory framework(Bozkurt et al., 2020), The primary objective of this research is to comprehensively explore the legal landscape surrounding AI adoption in education within the UAE's unique legal context. It will analyze the UAE laws, regulations, and policies that govern the use of AI technologies in educational settings, ensuring full compliance with the country's legal requirements, the study will highlight the critical responsibilities that UAE teachers' shoulder in the context of AI integration. As AI technologies increasingly become integral to the educational experience, educators play a crucial role in ensuring that AI is used ethically, equitably, and in line with the principles set forth by the UAE's legal framework, by examining relevant UAE laws and regulations, this research aims to equip teachers with the knowledge needed to embrace AI responsibly and make informed decisions in their classrooms(Kamp, 2020). Understanding the legal implications of AI adoption will enable educators to protect student rights, privacy, and data security while leveraging AI technologies to their full potential, in line with the UAE's commitment to innovation, this study will explore the legal considerations specific to the country's educational landscape, providing valuable insights to policymakers, educational institutions, and teachers alike (Abdallah et al, 2023). It seeks to facilitate a smooth integration of AI in education while safeguarding the rights and interests of all stakeholders involved, Throughout the subsequent sections, we will delve into the specific legal aspects and challenges related to AI adoption in the UAE's educational sphere. By addressing data privacy, intellectual property rights, liability, and other relevant concerns, this research will offer practical guidance for educators to fulfill their obligations in compliance with UAE laws (Abdallah, & Farhan, 2023).

As the UAE continues its journey towards a knowledge-based society, this research aims to contribute to the ongoing dialogue on responsible and ethical AI integration in education. By fostering a thorough understanding of the legal framework, we aspire to pave the way for a technologically advanced yet legally compliant educational landscape that ensures a bright future for students, educators(Nguyen, Ngo, Hong, Dang, & Nguyen, 2023), and the nation as a whole.

Artificial Intelligence (AI) adoption in education brings transformative opportunities and legal challenges. This study explores the legal implications of AI integration in the UAE's educational landscape and the corresponding responsibilities of teachers, and to achieve this goal we will address the subject of **the study as follows:**

## **LEGAL IMPLICATIONS OF AI ADOPTION IN EDUCATION**

### **Teacher Responsibilities in AI-Enabled Classrooms**

#### **Legal Implications of AI Adoption in Education.**

The widespread adoption of Artificial Intelligence (AI) in the field of education has ushered in a new era of transformative opportunities and challenges. As AI continues to shape the educational landscape,

it becomes crucial to examine the legal implications surrounding its integration. This study delves into the specific legal considerations related to AI adoption in education, focusing on the United Arab Emirates (UAE) legal framework, and is divided into two distinct parts.

## **Understanding the UAE Legal Framework for AI Adoption in Education**

Education is a fundamental element for the development of a nation and the best investment in its youth, for that reason, the UAE Vision 2021 National Agenda emphasizes the development of a first-rate education system, which will require a complete transformation of the current education system and teaching methods (E. M. Alqodsi, Jadalhaq, & El, 2023). The National Agenda aims for all schools, universities and students to be equipped with Smart systems and devices as a basis for all teaching methods, projects and research (Abdallah & Alkaabi, 2023).

In this section, we will comprehensively explore the existing UAE laws, regulations, and policies that govern the integration of AI technologies in the educational sector. We will analyze how these legal frameworks impact various aspects of AI adoption (E. M. Alqodsi et al., 2023), such as data privacy, security, intellectual property, and ethical considerations. By gaining insights into the UAE's legal landscape, we aim to provide educators, policymakers, and educational institutions with a clear understanding of the legal parameters that govern AI implementation in classrooms.

## **Digital Transformation Journey in Education**

The journey of education in the UAE has been through many milestones, beginning with its inception in 1971 when the percentage of those who read and wrote was very small. From then, the ministry worked with the support of the wise leadership to develop the educational system, whereby the UAE joined the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in April of 1972. This was a remarkable acceleration in the development of education which continued to include free education in government schools for both males and females (Rodrigues, 2017). In 2012, H.E. Sheikh Mohammed bin Rashid Al Maktoum launched the Mohammed bin Rashid Smart Learning Initiative which comprised of all UAE's schools in an attempt to create a new educational environment within them. This initiative encompassed Smart classes in all schools, the distribution of tablets to all students, and the provision of high-speed 4G networks to all UAE's schools (Brooks & McCormack, 2020).

Moreover, the UAE has implemented a distance education system for all students as of March 22, 2020 which was implemented in public and private schools as well as higher education institutions. Additionally, the UAE has developed a system to effectively implement distance education, including offering specialized training for teachers to enhance their abilities to manage the educational process remotely.

## **Digital Transformation Committee**

The Ministry of Education has also formed the Pioneers of Digital Smart Electronic Transformation Committee for the Ministry of Education services, headed by the Undersecretary of the Ministry of Education for Performance Improvement (Ahmed, Januel, & Fuenmayor, 2021).

The committee aims to ensure the provision of easy and simple services of high quality to customers. It also works to measure the level of public awareness on the Ministry's services and work towards enhancing awareness to boost the customer's use of these services (Abdallah & Abdallah, 2023).

## Key Roles of the Committee

- Overseeing the digital transformation in MoE
- Ensure that all indicators of the smart government criteria are implemented.
- Supervising projects and initiatives developed by the Telecommunications and Digital Government Regulatory Authority
- Continuously monitoring sub-teams work related to smart Government indicators.
- Supervising the Ministry's preparation to assess the possible entity for smart government indicators—the Telecommunications and Digital Government Regulatory Authority – in coordination with sub-committees.

## **CUSTOMER TRUST AND CYBERSECURITY**

Within the framework of the Ministry's goal of achieving the objectives of "secure educational environments,"(Ameen et al., 2021) and the United Arab Emirates in a safe digital environment. A comprehensive information security concept was developed by:

Having a security operation Center that works on monitoring, detecting and defending cyber-attacks 24/7 using the latest technologies like SIEM which is supported by Artificial intelligence. Also, monitoring more than 60,000 user devices and protect them from malicious activities using EDR.

Establishing a security incident response team that is available 24/7 to handle the incidents.

Conducting a rotational internal and external security assessment to find and mitigate the threat risk for more than 184 systems.

Manage the security risks of identifying assets.

Using the latest technology (Security Mail Gateway) to protect the emails attacks.

Developing information security policies for cyber-security.

Performing a cyber-Security awareness has increased the security awareness compared to the previous years.

Building a partnership with security and local authorities

Annually, the Ministry's website undergoes an evaluation by a team from the Telecommunications and Digital Government Regulatory Authority to ensure that it is achieving excellence in the indicators of smart government enablers and to enhance the quality of its electronic presence.

This is done at the end of each year by monitoring and measuring the level of commitment of the federal entities to smart government enablers and indicators and to implementing the standards set by government guidelines.

## **NAVIGATING LEGAL CHALLENGES AND ENSURING COMPLIANCE**

The incorporation of artificial intelligence (AI) into the education system gives rise to intricate legal obstacles that require thorough consideration. This section aims to pinpoint and examine the particular legal hurdles that educational stakeholders might face while embracing AI technologies. Our focus will encompass essential matters like data protection, student privacy, liability, and transparency, all of which are crucial for adhering to UAE laws and regulations(Solaiman, 2020). By providing guidance on effec-

tively navigating these challenges, our objective is to support educators and institutions in responsibly adopting AI while ensuring the protection of students' and stakeholders' rights and interests (Mohammed, 2021). Let's delve into a detailed explanation of each aspect mentioned:

**Complex Legal Challenges:** The use of AI in education presents various legal complexities due to the novel and rapidly evolving nature of AI technology (Carrillo, 2020). Educational stakeholders, such as schools, universities, and other institutions, need to be aware of these challenges to make informed decisions about AI adoption. The paragraph highlights the complex legal challenges that arise from the use of artificial intelligence (AI) in education (E. M. Alqodsi & Aljahoori, 2023). Here's a detailed explanation of each aspect mentioned:

**Use of AI in Education:** emphasizing the integration of AI technology into the education sector. AI is a rapidly developing field that involves the creation of intelligent machines capable of performing tasks that typically require human intelligence, such as learning from data, recognizing patterns, and making decisions.

**Legal Complexities:** When AI is applied in the educational context, it introduces various legal complexities. The term "complexities" refers to the intricate and multifaceted legal issues that may arise as a result of using AI technology in educational settings. These complexities can emerge from different aspects of AI implementation, ranging from data usage to decision-making processes.

**Novel and Rapidly Evolving Nature of AI:** AI technology is still relatively new and continually evolving. This novelty and rapid pace of change mean that the legal framework surrounding AI in education is constantly evolving as well. This makes it challenging for educational stakeholders, including schools, universities, and institutions, to keep up with the latest legal requirements and best practices (E. Alqodsi, 2023).

**Awareness and Informed Decisions:** Given the legal complexities and dynamic nature of AI, educational stakeholders must be well-informed and aware of the potential legal challenges associated with AI adoption. This awareness is essential to make educated decisions about whether to integrate AI into their educational programs, curricula, or administrative processes.

**Informed Decisions about AI Adoption:** The paragraph stresses the significance of informed decision-making regarding AI adoption. Educational stakeholders must carefully evaluate the benefits, risks, and legal implications of incorporating AI into their educational systems. This involves considering factors such as the impact on students, potential changes in data handling and privacy practices, and adherence to relevant laws and regulations (Lee & Yoon, 2021).

In summary, the paragraph underscores the importance of understanding and addressing the legal complexities that arise when implementing AI in education. Educational stakeholders must stay informed about the evolving nature of AI technology and the corresponding legal framework to make well-considered decisions about integrating AI into their educational practices. By doing so, they can navigate potential legal challenges and ensure that AI is implemented responsibly, ethically, and in compliance with applicable laws and regulations.

**Data Protection:** One significant concern when using AI in education is the protection of data. AI systems often require access to large amounts of data to learn and improve. This data may include sensitive information about students and educators. UAE laws likely require educational institutions to follow strict data protection regulations to safeguard personal information and ensure that AI systems

## ***Navigating the Legal Landscape***

are not misused or accessed by unauthorized individuals, The United Arab Emirates (UAE) does not have a comprehensive standalone data protection law. However, data protection is addressed through various laws and regulations that provide safeguards for personal information and data privacy. Here are some of the relevant laws and regulations in the UAE that pertain to data protection:

**Federal Law No. (2) of 2019 on the Use of Information and Communication Technology in Health Fields:** This law governs the use of information and communication technology (Jadalhaq & Alqodsi, 2018) (ICT) in the health sector (E. M. Alqodsi, 2021b), including the protection of health-related data. It sets out provisions for the collection, storage, and sharing of health data, with an emphasis on maintaining confidentiality and ensuring data security (Kandeel, Abueida, & Kandeel, 2023).

**Federal Law No. (9) of 2012 on Regulating the Processing of Personal Data:** Though this law does not explicitly address data protection (Borgesius, 2016), it includes provisions relevant to the processing of personal data. It lays down rules (Shandi, 2010) for the lawful processing of personal information, the rights of data subjects, and the obligations of data controllers and processors.

**The Dubai International Financial Centre (DIFC) Data Protection Law:** The DIFC, a financial free zone in Dubai, has its own data protection law, which is based on international standards. It governs the processing of personal data within the DIFC and aims to protect the privacy and rights of individuals whose data is processed within the jurisdiction (Baker, 2021).

**The Abu Dhabi Global Market (ADGM) Data Protection Regulations:** Similar to the DIFC, the ADGM, another financial free zone in Abu Dhabi, has its own data protection regulations. These regulations aim to safeguard personal data processed within the ADGM and provide individuals with certain rights and protections concerning their data (Chemlali, Salmi, & Benseddik, 2023).

**Sector-Specific Regulations:** Depending on the nature of the educational institution and the type of data processed, there may be additional sector-specific regulations that apply. For example, educational institutions operating within free zones like the DIFC or ADGM would need to comply with the respective data protection laws in those zones (Otjacques, Hitzelberger, & Feltz, 2007).

It's important to note that data protection laws in the UAE are continuously evolving, and there have been discussions about introducing a comprehensive federal data protection law. As AI technology becomes more prevalent in various sectors, including education, it is likely that the UAE will further strengthen its data protection regulations to address emerging challenges and protect individuals' privacy rights.

Educational institutions in the UAE using AI in education must be aware of the relevant laws and regulations governing data protection. They should take measures to ensure the secure and lawful handling of sensitive information about students, educators, and other stakeholders. Implementing robust data protection practices will help safeguard personal information and prevent unauthorized access or misuse of data by AI systems or any other parties (Jandigulov et al, 2023).

**Student Privacy:** Student privacy is a crucial aspect of data protection in education. It centers on safeguarding the personal information and data of students who are enrolled in educational institutions. This data may include sensitive details such as names, addresses, contact information, academic records, health information, and any other information that could identify an individual student (Rubel & Jones, 2016).

**Respecting Student Privacy Rights:** Educational stakeholders, which may include schools, universities, teachers, administrators, and AI developers, must ensure that they respect the privacy rights of

students. This means taking appropriate measures to protect students' personal information from unauthorized access, use, or disclosure (Pedro, Subosa, Rivas, & Valverde, 2019).

**AI and Student Data:** The use of AI in education often involves collecting and processing large amounts of student data to tailor educational experiences, personalize learning, and make data-driven decisions. While AI can offer numerous benefits in improving educational outcomes, it also requires careful attention to data privacy to avoid potential risks and violations of students' rights (Rezgui & Marks, 2008).

**Appropriate and Responsible Data Usage:** Educational stakeholders using AI must ensure that student data is used in a manner that aligns with the purposes for which it was collected (Siyam & Hussain, 2021). This involves using the data solely for educational and academic purposes and refraining from any unauthorized or unrelated uses. Additionally, the data should be processed responsibly (E. M. Alqodsi, 2021a) and securely to prevent breaches or data leaks.

**Compliance with Laws and Regulations:** UAE laws and regulations likely include provisions related to student privacy and data protection. Educational stakeholders using AI in education must adhere to these laws to protect student privacy rights and avoid any legal consequences for mishandling student data (Badri, Al Nuaimi, Guang, & Al Rashedi, 2017).

**Transparency and Consent:** To uphold student privacy, educational stakeholders should be transparent about the data collection and processing practices involved in AI-based educational applications. Students and their parents or guardians should be informed about how their data will be used and have the opportunity to provide informed consent.

**Data Retention and Deletion:** Educational institutions and AI developers must also have policies in place regarding data retention and deletion. Student data should not be retained for longer than necessary and should be securely deleted when it is no longer needed for its original purpose.

In summary, ensuring student privacy in the context of using AI in education is vital for protecting the rights and interests of students. It involves taking appropriate measures to safeguard student data, using it responsibly and transparently (Jadalhaq, Abdulhay, Alqodsi, & El Maknouzi, 2023), and complying with relevant data protection laws and regulations. By prioritizing student privacy, educational stakeholders can build trust with students and their families, create a safe learning environment, and enhance the ethical use of AI in education.

**Liability: AI in Educational Decision-Making:** The integration of AI in education often involves using AI algorithms to analyze data, make predictions, and assist in decision-making processes. These decisions can range from recommending personalized learning paths for students to automating administrative tasks, such as grading and scheduling (Ali, 2018).

**Liability Concerns:** When AI is utilized in decision-making that impacts students, educators, or other stakeholders, there is a potential for errors or negative consequences to occur. These errors might include misinterpreting data, biased decision-making, or misclassifying students' abilities or needs. Negative consequences could lead to students receiving inappropriate learning recommendations or facing administrative issues.

**Clarifying Responsibility and Accountability:** The question of liability arises when errors or negative outcomes occur due to AI involvement in decision-making. It becomes crucial for educational institutions and AI developers to clarify who bears responsibility (Jadalhaq & Alqodsi, 2018) for these outcomes. This includes determining whether the liability lies with the institution implementing

## ***Navigating the Legal Landscape***

the AI system, the developers who designed the AI algorithms, or a combination of both(Boelen, Dharamsi, & Gibbs, 2012).

**Legal and Ethical Implications:** The issue of liability is not only a legal concern but also an ethical one.

Educational stakeholders must ensure that AI is used responsibly and that decisions made by AI systems align with ethical guidelines and principles. This involves being aware of potential biases in AI algorithms and taking steps to mitigate their impact on decision-making.

**Protecting Students' Rights:** Ensuring clarity regarding liability is essential for protecting the rights of students and other individuals affected by AI-driven decisions. Students have the right to receive fair and unbiased treatment, and educational institutions must safeguard these rights when implementing AI technologies.

**Transparency and Explainability:** To address liability concerns, AI systems should be designed with transparency and explainability in mind. Educational stakeholders should be able to understand how AI algorithms arrive at their decisions and be able to explain those decisions to students and parents. Transparent AI systems enable better accountability and help identify and rectify any potential issues.

**Risk Mitigation:** Educational institutions and AI developers can take proactive measures to mitigate liability risks. This includes conducting thorough testing and validation of AI algorithms before deployment, ongoing monitoring of AI system performance, and implementing feedback loops to correct errors and biases.

**Insurance and Contracts:** Educational institutions and AI developers may also consider liability insurance and contractual agreements to allocate responsibility and protect against potential financial losses due to AI-related issues.

**Compliance with Regulations:** Compliance with relevant UAE laws and regulations is essential in managing liability concerns. Staying up-to-date with the legal landscape ensures that AI implementation adheres to established standards and requirements.

addressing liability concerns in the context of AI-driven educational decision-making is crucial for ensuring accountability, protecting students' rights, and maintaining ethical and responsible use of AI in education. By understanding and clarifying liability issues, educational stakeholders can take proactive measures to prevent errors, minimize negative consequences, and build trust in the adoption of AI technologies for educational purposes.

**Transparency:** The transparency of AI systems is essential in the educational context. Users, including students and educators, should be informed about how AI technologies are being used and the criteria used for making decisions(Holmes et al., 2021). Transparency helps build trust and ensures that AI is used ethically and responsibly.

**Compliance with UAE Laws and Regulations:** The UAE likely has laws and regulations that govern the use of AI in various sectors(E. M. Alqodsi & Gura, 2023), including education. Educational stakeholders must comply with these laws to avoid legal issues and potential penalties. By following the relevant regulations, they can ensure that AI adoption in education is conducted lawfully.

The overall goal of the paragraph is to provide guidance to educators and institutions in the UAE on how to navigate legal challenges and ensure compliance while embracing AI in education. By addressing data protection, student privacy, liability, and transparency, educational stakeholders can integrate



AI responsibly, safeguarding the rights and interests of students and other stakeholders involved in the education process. It shows a commitment to using AI technology ethically and in accordance with UAE laws (Abu El-Haija, 2010), ultimately fostering a positive and responsible AI-driven education environment.

## **TEACHER RESPONSIBILITIES IN AI-ENABLED CLASSROOMS**

In today's rapidly evolving educational landscape, the integration of artificial intelligence (AI) has emerged as a transformative force. AI-enabled classrooms hold the promise of enhancing teaching and learning experiences, but they also bring about unique challenges and responsibilities for educators. As we navigate this exciting intersection of technology and pedagogy, it becomes imperative to understand the vital role that teachers play in AI-powered learning environments, we will first delve into the general responsibilities teachers must embrace in AI-powered education. Subsequently, we will turn our attention to the specific legal and ethical obligations that educators in the United Arab Emirates (UAE) must uphold. This includes compliance with UAE's data protection laws and ensuring that AI integration in classrooms aligns with the nation's ethical and cultural norms.

### **Compliance With Data Protection Laws in the United Arab Emirates**

In the rapidly advancing digital era, the collection, storage, and utilization of personal data have become integral to various aspects of our lives, including education. In the United Arab Emirates (UAE) (Morgan, Warren-Smith, & Kelly, 2020), as in many other nations, the safeguarding of individuals' personal information is not only a fundamental right but also a legal obligation. Teachers, as key participants in the educational process, are entrusted with the responsibility of handling student data with utmost care and in strict adherence to data protection laws. Failure to do so can result in significant legal consequences.

The UAE has enacted comprehensive data protection laws and regulations to ensure the privacy and security of personal information (Thomas & Khoja, 2022). These laws impose specific obligations on educational institutions and their staff, including teachers, to guarantee that the data of students and stakeholders are treated with the highest standards of confidentiality and integrity. In this section, we will delve into the key data protection laws in the UAE that teachers must diligently uphold, understanding the potential legal liabilities associated with non-compliance.

The UAE primarily relied on various laws and regulations that touched on data protection, confidentiality, and information security, including:

- 1: The Personal Data Protection Law, Federal Decree Law No. 45 of 2021 regarding the Protection of Personal Data, constitutes an integrated framework to ensure the confidentiality of information and protect the privacy of individuals in the UAE. It provides a proper governance for data management and protection and defines the rights and duties of all parties concerned (Chemlali et al., 2023).

#### Provisions of the Law

- The provisions of the law apply to the processing of personal data, whether in full or part through electronic systems, inside or outside the country.

## ***Navigating the Legal Landscape***

- The law defines the controls for the processing of personal data and the general obligations of companies that have personal data to secure it and maintain its confidentiality and privacy (Meenagh & Elsayed, 2018). It prohibits the processing of personal data without the consent of its owner, except for some cases in which the processing is necessary to protect a public interest or to carry out any of the legal procedures and rights.
- The law gives the owner of the data the right to request for corrections of inaccurate personal data and to restrict or stop the processing of his personal data.
- It sets out the requirements for the cross-border transfer and sharing of personal data for processing purposes.

The Personal Data Protection Law, the UAE's inaugural federal legislation in this realm, was collaboratively developed in conjunction with prominent private-sector technology companies. This law came into effect on January 2, 2022.

- 2: Data Protection Law, DIFC Law No 5 of 2020- Dubai International Financial Centre (Baker, 2021)
- 3: Protection of health data and information: Federal Law No. 2 of 2019 Concerning the Use of Information and Communication Technology (ICT) in Health Fields regulates the use of information and communication technology (ICT) in the health care sector in the UAE (McGraw & Mandl, 2021), including its free zones.
- 4: Protecting data and privacy online: Law on combatting rumours and cybercrimes, Federal Decree Law No. 34 of 2021 on Combatting Rumours and Cybercrimes provides a comprehensive legal framework to address the concerns relating to the misuse and abuse of online technologies (Chen, 2021). It aims to enhance the level of protection from online crimes committed through the use of information technology, networks and platforms.
- 5: Internet Access Management (IAM) policy: Telecommunications and Digital Government Regulatory Authority (TDRA) implements the Internet Access Management (IAM) policy in the UAE, in coordination with National Media Council and Etisalat and Du, the licensed internet service providers in the UAE. Under this policy, online content that is used for impersonation, fraud and phishing and/or invades privacy can be reported to Etisalat and Du to be taken down (DeBose, 2023).
- 6: Electronic Transactions and Trust Services law: The law regulates the validity of electronic documents and boosts the legal value of digital signature and the level of its security. It provides provisions for eTransactions, the way eDocuments should be stored and saved, and sent and received to be valid. It also sets licensing requirements for trust services providers who are duly licensed to create, validate and preserve eSignatures, eSeals and digital certification (Abdallah & Musah 2023).
- 7: The UAE's Constitution: Article 31 of the UAE's Constitution provides for the freedom of communication by means of post, telegraph or other means of communication and guarantees their confidentiality in accordance with the law.

In the United Arab Emirates, as the realm of education becomes increasingly intertwined with data-driven technology, educators find themselves at a pivotal juncture where they must skillfully navigate the intersection of learning and data protection. The UAE's comprehensive data protection laws and regulations lay down clear guidelines and obligations for teachers and educational institutions to uphold the privacy and security of personal information. Non-compliance with these laws can lead to serious legal consequences.

To succeed in this delicate balancing act, teachers must prioritize both educational excellence and data protection (Darawsheh et al,2023).

### **How They Can Achieve This Equilibrium?**

- 1: Familiarity with UAE Data Protection Laws(Greenleaf, 2022): First and foremost, educators should make a concerted effort to understand the specific data protection laws and regulations applicable in the UAE. Staying informed about legal requirements is essential to ensuring compliance.
- 2: Data Minimization: Collect and store only the data that is essential for educational purposes. Avoid unnecessary data collection(Al-Awadi & Saidani, 2010), and regularly review and delete data that is no longer needed.
- 3: Consent and Transparency: Seek informed consent from students and their parents or guardians when collecting and processing their personal data. Maintain transparency about how the data will be used and who will have access to it.
- 4: Data Security Measures: Implement robust data security measures to protect personal information from unauthorized access or breaches. This includes encryption, access controls, and regular security audits.
- 5: Training and Awareness: Provide training to teachers and staff on data protection principles and best practices. Promote a culture of data protection awareness within the educational institution (Abdallah & Alkaabi,2023).
- 6: Data Privacy Impact Assessments: Conduct assessments to evaluate the potential impact of data processing activities on the privacy and rights of students and stakeholders. Mitigate risks and ensure compliance accordingly.
- 6: Collaboration with IT Departments: Work closely with your institution's IT department or technology partners to ensure that educational technology platforms and systems comply with data protection requirements.
- 7: Legal Counsel: When in doubt or faced with complex data protection issues, seek legal counsel or consult your institution's legal experts for guidance.

By diligently adhering to these principles and maintaining a careful balance between educational objectives and data protection requirements, teachers in the UAE can create a learning environment that not only nurtures academic growth but also respects the privacy and security of student data. This proactive approach not only safeguards against potential legal repercussions but also sets a strong ethical foundation for responsible teaching in the digital age.

### **Adhering to the Ethical and Cultural Norms Embraced by Educators in the Era of Technology**

In the current era of rapid technological advancement, the role of educators extends beyond traditional pedagogical practices. Educators are not only responsible for imparting knowledge but also for upholding and embodying a set of ethical and cultural norms that align with the demands and challenges of this digital age (Abdallah et al,2023; Jandigulov et al.,2023). This entails a commitment to adhering to these norms, ensuring that education remains a responsible and culturally sensitive endeavor in an increasingly technology-driven world(Kezar, Carducci, & Contreras-McGavin, 2006).

## Achieving the Alignment of Ethical and Cultural Norms With the Responsibilities of Educators in the Age of Technology Can Be Accomplished Through Several Key Strategies

- 1: **Ethical Leadership:** Teachers should serve as ethical leaders in the classroom, modeling behaviors and attitudes that reflect the values and norms of respect, integrity, and responsibility (Mihelic, Lipicnik, & Tekavcic, 2010). By consistently demonstrating these qualities, educators set a positive example for their students.
- 2: **Cultural Competence:** Understanding and respecting the cultural backgrounds of students is paramount. Teachers should educate themselves about the diverse cultures represented in their classrooms and adapt their teaching approaches to be culturally sensitive and inclusive (Khalil et al., 2023; Tanner & Allen, 2007).
- 3: **Digital Literacy and Citizenship:** Teachers should actively incorporate digital literacy education into their curricula, teaching students how to use technology responsibly and ethically (Badawy & Alkaabi, 2023; Ibrahim et al., 2024). This includes discussions on online etiquette, cyberbullying prevention, and critical thinking in the digital sphere (Öztürk, 2021).
- 4: **Incorporate Diverse Perspectives:** Ensure that the educational materials and resources used in the classroom are culturally diverse and representative of various backgrounds and perspectives (Kumi-Yeboah & Amponsah, 2023). This promotes inclusivity and helps students appreciate different cultures.
- 5: **Open Dialogue:** Create a classroom environment where students feel comfortable discussing ethical and cultural issues related to technology. Encourage open dialogue and critical thinking to explore these topics.
- 6: **Professional Development:** Teachers should engage in ongoing professional development to stay updated on best practices in both education and technology, including ethical considerations. Workshops, courses, and conferences can provide valuable insights (Alkaabi, 2023; Alkaabi et al., 2023; Alkaabi & Almaamari, 2020; Alaktoum & Alkaabi, 2024).
- 7: **Collaboration:** Collaborate with colleagues, parents, and the wider community to address ethical and cultural considerations in education. This can include seeking input from parents of diverse backgrounds and involving the community in school activities.
- 8: **Assessment and Reflection:** Regularly assess the effectiveness of your teaching methods in integrating ethical and cultural norms into the curriculum. Reflect on what works and what can be improved to align with evolving educational and technological landscapes (Alkaabi & Almaamari, 2020).
- 9: **Personal Growth:** Engage in continuous self-reflection and growth as an educator. This includes examining your own biases, values, and perspectives to ensure they align with the ethical and cultural norms you aim to impart (Al-Zoubi et al., 2023).
- 10: **Policy Advocacy:** Advocate for policies and practices within educational institutions and at the policy-making level that promote ethical and culturally sensitive education in the digital age (Musah et al., 2023).

By actively embracing these strategies, educators can fulfill their responsibility of aligning with ethical and cultural norms while navigating the challenges and opportunities presented by the era of technology. In doing so, they contribute to creating a more inclusive, responsible, and culturally sensitive educational environment.

## **CONCLUSION**

In the journey of integrating artificial intelligence (AI) into education, understanding the intricate legal landscape and upholding teacher responsibilities is of paramount importance. This exploration has revealed key insights and recommendations:

## **RESULTS**

**Legal Frameworks Exist:** Various countries, including the United Arab Emirates, have established legal frameworks to govern AI adoption in education. Compliance with these laws is essential to ensure the responsible use of AI.

**Teacher Roles Evolve:** Educators play a pivotal role in AI-enabled classrooms. They are not only instructors but also guardians of ethical and cultural norms, responsible for the well-being of students and the protection of their data.

**Data Protection Is Critical:** Teachers must diligently adhere to data protection laws, such as those governing personal data in the UAE, to safeguard student information. Non-compliance can result in legal liabilities.

## **Recommendations**

- 1: **Legal Awareness:** Teachers should stay informed about the AI and data protection laws applicable in their jurisdiction, seeking legal counsel when needed. Keeping abreast of legal changes is crucial.
- 2: **Ethical Leadership:** Embrace ethical leadership by modeling responsible technology use and cultivating a classroom culture that values respect, integrity, and cultural sensitivity.
- 3: **Cultural Competence:** Promote cultural competence by understanding and celebrating diversity, ensuring that educational materials reflect different perspectives, and fostering inclusivity.
- 4: **Digital Literacy:** Incorporate digital literacy and responsible online behavior into the curriculum, teaching students to use technology ethically and critically.
- 5: **Open Dialogue:** Encourage open dialogues with students about ethical and cultural aspects of technology. Create a safe space for discussions and critical thinking.
- 6: **Professional Development:** Engage in ongoing professional development to stay current on educational technology and ethical considerations, attending relevant workshops and training.
- 7: **Assessment and Reflection:** Continuously assess the effectiveness of integrating ethical and cultural norms into education, reflecting on improvements needed.
- 8: **Policy Advocacy:** Advocate for policies that promote ethical AI adoption in education at institutional and policy-making levels.

As educators and education systems continue to evolve with technology, it is incumbent upon teachers to embrace their multifaceted roles. By navigating the legal landscape with awareness and dedication, educators can ensure that AI adoption in education is not only innovative but also responsible, fostering a harmonious balance between technology and human values. In doing so, they equip students with the skills and ethics necessary for success in an ever-changing world.

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Section 4

# Innovation in Assessment and Evaluation

# Chapter 16

## The Power of Peer Review: Harnessing Collaborative Insights for Authentic Assessment

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### ABSTRACT

*This chapter delves into the transformative power of peer review in educational settings, exploring its application in fostering critical thinking, collaboration, and metacognitive skills among students. It examines various peer review methodologies, emphasizing their role in enhancing student engagement, motivation, and soft skills development. The chapter highlights the significance of integrating peer review into teaching strategies, outlining its benefits in building a cooperative learning environment. Through case studies and practical applications, the chapter demonstrates the efficacy of peer review in improving academic outcomes and fostering a culture of continuous improvement and innovation in educational practices.*

### INTRODUCTION

In Education field, peer review is a collaborative learning technique wherein students assess other student's work and provide feedback to help them improve the overall learning process. It also assists the students to get insights and gain understanding about peer's work; hence, it tends to improve the quality of the learning experience. In many literatures, peer review is referred to peer evaluation, response or

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## ***The Power of Peer Review***

peer assessment in which students are involved to review the material from critical perspective with different approaches (Topping, 2023). This activity is typically beneficial in triggering critical reasoning and self-assessment skills in students. Peer review has proved to be a powerful evaluation strategy which brings numerous advantages to the students such as facilitating student's acquisition and developing skills that promotes self-direction of own learning.

In recent years, the concept of peer review in higher education has gained attention due to its impact on collaborative learning. Over three decades, peer review has been used in different disciplines and especially in education as a formative process that aims to improve student's learning experience. In student-learning context, peer review is termed as a process wherein students evaluate the value and quality of fellow student's work by simply giving feedback or response as per own understanding. As per the study of Peters et al., (2023), student peer- review shifts the traditional notion of assessment by teachers only as it encourages the students to take an active role in managing their own learning.

In contemporary classrooms, peer- review comes in varied forms such as evaluating written assessments, oral presentations, artwork, programming and code reviews in different teamwork. In classrooms, the activity of peer review is used to help students invest in writing and to understand the relationship between their writing and their coursework. Hence, it engages the learners to encourage self-reflexivity which eventually fosters critical thinking skills (Noroozi et al., 2023). At the same time, it provides a structured learning process for the students wherein they can assess other's work and develop collaborative learning experience by focusing on new techniques and ways to improve the learning journey. Peer review assist the students to engage in metacognitive reflection in which they learn the correct as well as incorrect aspects in the answers by understanding the criteria outlined by the instructors. Therefore, this is effective in opening doors for collaborative exchange of ideas among students which not only improves their understanding but also helps them to produce better work in the future. Hence, according to contemporary classroom settings, peer review is more likely to create a cohesive community which develops various skills in students such as communication, collaboration and critical thinking ability (Martin & Bolliger, 2023).

## **Role of Peer Review in Education**

It encourages students to evaluate the work of others which is an important prospect of developing critical thinking skills as this requires analyzing competencies as well as weaknesses of fellow student's work. Also, engaging the students in peer review sessions allows them to receive as well as provide constructive feedback on their writing skills. This is helpful in refining the work. From the recent study of Werder & Otis (2023), it is analyzed that peer review process empowers the students to take ownership of their own learning as it shifts the role of instructor from being evaluator of own work (Alqodsi, E., & Aljahoori, 2023).

## **Objectives of the Chapter**

- To analyze the benefits of peer reviews in educational setting
- To ascertain the impact of peer review on student's learning and skill development
- To analyze criteria that is used to design peer review activities.

## **SECTION ONE: THEORETICAL FRAMEWORK OF PEER ASSESSMENT**

### **Pedagogical Theories Underpinning Peer Assessment**

Pedagogical model is based on five-evidence based domains which not only ensures high-quality learning practice but also it maintains student improvement in academic areas. For example, the first domain is Engage in which students are taught to engage and build supportive as well as inclusive environment wherein they can motivate others and can manage their own learning. Explore is another domain in which students are presented challenging tasks so that they can come up with innovative ideas. This is essential to expand student's understanding perspectives; hence, it prepares them to navigate their own leaning (Terrin & Triventi, 2023). Students are also explained about connecting with new technologies and ways so that they can monitor their progress and can emphasize on structured opportunities to develop new skills. As per the model, teachers challenge the students to move to deep learning and develop the ability to transfer and generalize their learning. They support the students to focus on developing reflective as well as self-monitoring skills. In addition to this, teachers also assist the students to use multiple forms of assessment to improve their learning. However as per the study of Burgess et al., (2021), peer review can be conducted with different approaches such as in Texas Tech method there is a mix of qualitative and quantitative feedback which is included in student's final grades. Another example is the Koles method in which the quality of the feedback is rated by the facilitator and then it is embedded in the peer review score.

### **Psychology of Evaluation**

Usually, students have the psychological belief in which they give value to teacher's assessment considering their expertise and knowledge. However, Liang & Leng, (2023) in this context says that many students enjoy receiving feedback from fellow students as they learn new things and new perspectives about teamwork aspects. Also, it develops collaboration among learners, and they tend to form new groups for improving their learning journey. Also, students prefer to give feedback to those who have assessed their work as this gives them the idea about the reliability of assessment.

### **Constructivist Approaches**

With various traditions and approaches to critical thinking, the traditional approach is being given importance which defines the capacity to interpret information and find new ways to solve the problems. However, this approach is also criticized as it manifests arguments on diverse perspectives; hence, it further raises question on its applicability in all areas. Thus, relating it to peer review, students not only think differently while reviewing other's writing but also, they ask questions about the topics which apparently transfers knowledge among peers. Alongside, it also supports constructivist learning which builds knowledge level of students as they develop interactions with fellow students (Nguyen & Habók, 2023).

## **SECTION TWO: BENEFITS OF PEER REVIEW**

### **Enhancing Engagement and Motivation**

Feedback is one of the critical parts of the learning process as it not only motivates students but also change their behavior and improve the learning journey. Peer review process exposes the students to involve in learning greater diversity of perspectives by focusing on fellow student's assignments and project work. Student's motivation improves when they are involved or allowed to collaborate and learn in groups. (Chan & Hu, 2023). For example, involving the students in peer review process not only helps them to communicate with other learners but also, they gain knowledge about the perspective of other students and how they learn and implement the knowledge.

In student peer review, students are engaged to evaluate the fellow student's assignment or coursework in which they review the answers as per own knowledge. This gives them the motivation to feedback to others and to learn from other students. The process eventually leads to collaborative work wherein students themselves take accountability of their own work and develop understanding about the mistakes and errors. Peer review develops self-reflection ability which allows the students to correct the mistakes on their own and understand the evaluation process effectively. Also, Einstein, (2023) says that peer review involves evaluation from students; therefore, it helps them to develop critical thinking as they evaluate and understand the work of fellow students.

### **Developing Soft Skills**

The higher education funding council for England has specified that effective feedback assist the learners to progress with confidence; hence, makes them lifelong learners. It is also a central aspect for learning which engages students in their own learning process (wherein they undertake both the roles of an examiner and examinee). It is defined as a communication process in which students enter in conversations related to performance and standards (Jung, Shin, Gohary & Chan, 2023). Moreover, it represents a teaching method wherein students teach others through the summative assessment. Students develop good communication with other students while reviewing their works; hence, as a result it creates better relationships among learners, and they become open to share their ideas and opinion on common subjects.

In addition to this, reviewing the work of others develops understanding ability of students as they learn about new perspectives and opinion that also improves their analytical skills. It is highly essential for the students to learn different opinion and ideas as that improves their critical ability power. Also, in order to review other student's work, collaboration is required wherein learners collaborate in a team and work together (Alt, Kapshuk & Dekel, 2023). This is a great way of learning about working in a team which prepares the students for future job.

### **Strengthening Understanding Through Teaching Peers**

In peer review process, students also communicate with the teachers and instructors regarding specific assessments; therefore, it eventually leads to strengthen the comprehension level which helps learners to come up with effective ways to manage their learning. Teachers play a crucial role in helping the students regarding ways to assess the projects; hence, this gives them the idea about evaluation criteria (Werder & Otis, 2023). Therefore, it develops student's understanding about how grades and markings



are provided in the schools. Also, in addition to this, through teaching peers, students can comprehend the ways to give feedback in right manner. Since peer review typically involves feedback on other's work; therefore, it is vital for the students to understand the value of constructive feedback.

It also fills knowledge gap especially while working with other students and understanding their viewpoints about specific matters. This not only improves collaboration between students but also it fosters social skills which eventually advances their learning journey. Students also get to learn about tutoring skills while giving feedback on other's answers; therefore, the process significantly teaches them different skills which are vital for the professional journey. Moreover, Japutra, Wang & Li, (2023) in the study states that peer review of students (when includes writing) allows them to have meaningful interactions with peers, also helps in learning about new perspectives on the writing process and gives them greater exposure to new ideas.

### **Case Studies Highlighting Successful Peer Review Implementations**

Many school networks and systems are tuning into peer review process in terms of addressing the changing nature of education-system and to improve the structural aspects. In this context, in recent publication, a case study has been identified in the University of Malaga (Spain) which implemented peer review strategies to promote student learning and help them develop cross-wise skills that improves their learning journey. It was an empirical study based on the application in higher education wherein more than 400 students were involved. Peer review was a learning technique in which students proactively evaluated the work of other students and this also had a greater impact on their academic performance level (Torres, 2021).

From the study, it has been found out that students are able to give same scores that is assigned by the teacher which means that students are able to evaluate consistently enough as per the teacher's standards. It has also been identified that students peer review process encourages their critical sense which allows them to identify errors and mistakes on their own (Torres, 2021). The case also reveals that application of peer review process improves student's academic and motivational perspectives. Students have shown greater interest in the evaluation process as this helped them to learn diversified perspectives from other students which sharpened student's problem-solving skills.

## **SECTION THREE: DESIGNING PEER REVIEW ACTIVITIES**

In order to design peer review activity, it is essential for the school instructor to define clear standards and guidelines so that students can follow the same.

### **Criteria for Peer Review Assignments**

It is required to have clear criteria for peer review assignments as this will help the students to deliver good feedback and at the same time it will ensure that learners are on the same page during the feedback process. For example, the feedback process should be goal-referenced, and the success criteria of the performance should be determined at the beginning phase. Students must be clear about the end goals of the tasks while doing peer review. In addition to this, the feedback should always be transparent and tangible related to the goal. For instance, students must provide detailing about learner's performance

## ***The Power of Peer Review***

and how well they reached the intended goals. Similarly, feedback must provide actionable suggestions which can help learners to know how they can improve their work (Yuan, 2023). This would prevent peer reviews from being personal attacks; hence, it can allow for opportunities of self-regulation and improvement.

One of the criteria should be user-friendly wherein feedback can be provided in the form of appraisal or encouragement. This is essential in terms of making other students feel positive and motivated about their assignments and at the same time, it will also help them to focus on improvements. Another important criterion should be timely feedback so that it can help learners to improve their current work (Chambers & Harkins Monaco, 2023). The school instructor must make sure that students provide peer feedback on time so that sooner the fellow students receive feedback, the faster they can make amendments in their work. Additionally, the most important criteria should be providing accurate feedback wherein students should know how to develop detailed feedback criteria that aligns to achievement of goals.

## **Structuring the Process**

Apparently, peer assessment can improve overall learning of students by helping them become better readers, writers and collaborators. While structuring the process, it is essential to determine where the activity should be conducted (in-class or out-of-class). The following structure is necessary to consider having a successful peer review process.

### **Before Peer Review Session**

- Students should be provided a sample paper to review and comment using the guidelines. They should also share the feedback in constructive and specific way as per the requirement (Deng, Liu & Feng, 2023).
- Also, students should consider paper exercise to learn about ways to respond and use appropriate comments to improve the writing. In addition to this, students should be asked to create a rubric in the class in terms of setting marking standards.
- At this stage students should be assigned in the groups. Also, specific criteria must be decided such as who will review, how many reviewers will be there and how many reviews each assignment will receive (Collier, 2023).

### **During and After Peer Review Session**

- Clear directions as well as time limits should be decided and communicated to the students for in-class peer review sessions. Additionally, specific deadlines are to be given for out-of-class review assignments.
- During peer review session, students should listen as well as provide guidance to each other when necessary (Lowe, Cummins, Clark & Porter, 2023).
- Students should submit their peer feedback along with their final papers. It is essential to consider the feedback while grading the paper so that student's assessment value can be determined.
- The quality of the received feedback should be assessed so that students can analyze the areas of further improvements.

- The entire process could be discussed in the class and in the same way problems can be addressed (Liang & Leng, 2023). This is yet another way of improving learning cycle of learners.

### **Providing Guidelines and Rubrics to the Students**

The main goal of conducting peer review is to help students learn about giving effective feedback to the fellow students about their writing. Therefore, while providing reviews, the paper should be read properly to get sense out of it and accordingly comments should be provided in the form of feedback (Liu et al., 2023). Here are some of the guidelines which students should consider.

- One should be always mindful of the tone that is used to respond to peer's writing. For example, integrating a couple of positive comments in the feedback would not only encourage others but also it will extend support to other learners.
- Feedback should be based on constructive suggestions in which students should help the fellow classmate understand how the writing paper affects the reader. Hence, questions can be asked for better clarity of assessment. For example, questions can be asked about claims and evidence of the writing paper which will also focus on a particular point.
- At the time of addressing sentence formation issues, reviewer can look for patterns of errors rather than merely pointing out errors (Jongsma et al., 2023). Students can also try to offer new ideas to the writer about the generalized issue instead of pointing out the mistakes.

### **Addressing Challenging Such as Reliability and Fairness**

It is essential for the instructor to highlight the guidelines and rubrics as on that basis only marking and grades can be provided. However, the challenges associated with peer review should not be overlooked especially when reviews are done in the same classes. For example, students must be taught to provide fair reviews to fellow student's work even if they do not have appropriate understanding between them (Zhu & Zhang, 2023). Often students who are not friends with each other prefer to put down the other through providing negative comments and feedback on the writing. Therefore, it is crucial to have fairness in the process despite of the existing differences. Also, those students those are efficient in writing usually expect full marks and appreciation in all their answers; however, when they get suggestions from others, they get demoralized. Moreover, it is also necessary to ensure that student peer review process is conducted in reliable way considering all necessary guidelines. In addition to this, friendship should not be the criteria of assessing other's work; hence, students are taught to avoid biasness while reviewing fellow classmate's work (Yuan, 2023).

## **SECTION FOUR: METHODOLOGIES AND TOOLS FOR PEER ASSESSMENT**

### **Traditional vs. Innovative Practices in Peer Review**

Apparently, writers need feedback on their writing as that assist them to improve. While instructor's feedback is valuable, fellow students should also be asked to respond to each other's work in terms of providing additional opportunities of learning. In this respect, the process of peer assessment can be

## ***The Power of Peer Review***

conducted in or out of the class such as through face-to-face or electronic sources. Also, groups or pairs can be formed to review the writings of others and it can be conducted in any way ranging from exchanging papers to using peer review programs like (SWoRD). For example, peer reviews can be organized as an in-class activity wherein students can be asked to assess other's writing paper in terms of gaining knowledge about how marks are given. Nguyen & Habók, (2023) in this context says that peer review is one of the productive practices that accomplishes writing ability of the students and help them to learn, give and receive feedback about their skills.

In other way, innovative peer review process includes self-evaluation reports which provides insights about the goals, accomplishments as well as the challenges faced in the program. However, traditionally, peer review used to be an anonymous process in which simply someone will assess the work and leave the comments as feedback (Mansurjonovich & Davronovich, 2023). There is no sort of suggestion of ideas or improvements and merely grade is provided to the writing work. The scenario has been changed a lot as nowadays, students are asked to collaborate with each other and provide meaningful feedback about each other's writing work. This process not only includes marking fellow student's work but also it develops understanding level of considering different perspectives of writing. In contemporary scenario, peer review for students has been used as a domain of learning which assist students to gain motivation, self-confidence and knowledge about diversified skills (Terrin & Triventi, 2023). Earlier peer review was a one-time event; however, it is not deemed as a continuous process that improves quality of learning. Hence, students in schools are often asked to participate in assessment practices so that they can learn about reporting the progress and outcomes of the improvement actions.

## **Digital Platforms and Tools That Facilitate Peer Assessment**

Turnitin PeerMark is a peer review assignment tool which assess essays, papers and other writing assignments. In this tool, instructor can create and manage PeerMark assignments which allows the students to read, review and evaluate papers that have been submitted by the classmates; however, the reviews remain anonymous. After submitting the work, students as well as provide feedback and instructor determines the pairing of groups for peer review. It includes both open and close- ended questions which are associated with detailed points. At the same time, inline and pop-up comments can also be added by peer students (Kang & Zhang, 2023). Apart from this, Google Workspace Tools (such as Docs, Slides and Sheets) are also available for peer review. These attributes include the ability to add watermark which automatically generates suggesting mode wherein changes can be made in the document.

The study of Latifi, Noroozi & Talae, (2023) highlights that Moodle workshop activity helps in collecting, reviewing and assessing student's work wherein students can submit digital files through using text editor. In accordance with the guidance of instructor, students can assess each other's work and give feedback or grades respectively. However, after the peer assessment window closes, instructor can review the grades (in order to make any adjustments if required) and then it can be posted to the Moodle gradebook. It is especially used for large classroom settings wherein teachers want students to grade their peers.

## **Incorporating Peer Feedback Into the Overall Assessment Strategy**

The main outcome of peer review process is the feedback that is being provided to the students about their writing work. In this context, feedback should be constructive and actionable; hence, it should

highlight the strengths as well as weaknesses of the paper. Alongside, the reviewer requires to provide specific and realistic suggestions for improvement as a part of the assessment. Apparently, in a school, teacher conducts the evaluation process in which performance of students is being assessed; however, now students are also given the opportunity to conduct peer review of fellow students in which they give feedback on other's writing paper (Awada & Diab, 2023). The main of this process is to foster student's awareness of their own and other's writing processes. Also, it reinforces course-specific criteria which is useful for written examination. It has been observed that both giving and receiving critical feedback teaches valuable skills to the students and it also allows them to gain multiple perspectives about writing as well as mimicking the process of peer review.

Integrating peer review feedback in the assessment strategy helps the students to become between writers and it also aids them to focus more on goals and academic objectives. According to the study of Qureshi et al., (2023), it is analyzed that feedback plays an important role in assessment strategy as it assists the learner to reflect on own learning; hence, they can make better strategies to progress in the learning journey. Since, the goal of feedback is to help student understand their capabilities and set clear goals for improvement; therefore, it must be incorporated thoroughly into the evaluation outcome. In addition to this, it helps students to plan better about the next processes or methodologies they will be opting to improve their learning patterns. Thus, the overall assessment should also include the perceptions which students have about their own learning and writing level.

## **SECTION FIVE: PEER REVIEW AS A LEARNING EXPERIENCE**

### **How Peer Review Contributes to Deeper Learning**

The study of Awada & Diab, (2023) articulates that when students are asked to provide feedback via peer instruction, the act engages them in complex problem-solving activity wherein they must analyze the errors and suggest solutions accordingly. Involvement in all these activities are the hallmarks of developing critical thinking ability. When students review the writing of others, they not only understand the topic from different perspective but also it develops their learning about new ideas which are written in the paper. Apparently, in order to improve learning, it is required to involve into new activities that gives knowledge about new aspects; hence, while assessing the writing of others, students can learn in better ways. On the other hand, receiving feedback on the writing also sharpens student's skills as they think or learn about new ways to solve the problems and improve the writing paper.

Another important aspect of improving learning is collaborating with others which provides the opportunity to share and receive innovative ideas on topics. Also, peer review is one of the ways through which students can receive faster feedback from diverse sources which further helps them to improve on time (Alt, Kapshuk & Dekel, 2023). This promotes active environment which offers more opportunities to improve by receiving and sharing knowledge and opinion with others. Peer-review assist the students to compare their writing with others and in this way, they can identify where they are lacking and what improvements they need for better writings. Thus, the quality of learning also amends when learning about new perceptions and ideas. Jung et al., (2023) in this context says that the comparative process encourages self-improvement as well as clarity of purpose while writing the papers. Assessing the work of others develops transferable skills in students which prepares them for life outside of school.

## ***The Power of Peer Review***

Typically, this process prepares them to review and engage with others and learn ways to work on own areas without losing the cool (Alqodsi et al., 2023).

### **Encouraging Reflection and Metacognition**

As per the view of Deng, Liu & Feng, (2023), peer assessment should be conducted humbly since it allows the students glean a better understanding of their own work which honors metacognitive capacity, and they can recognize holes in their own understanding. The act of peer assessment is quite helpful in training the students to self-correct and become less dependent on feedback from teachers. Henceforth, they become more independent in their learning. This is one of the common ways of making student independent wherein they not only chose how to learn but also, they find solutions to rectify their own mistakes. In this context, Collier, (2023) says that due to peer review individuals engage in metacognitive reflection wherein they pause and think and develop the ability to seek understanding about holistic alternatives. Therefore, students are taught to wire themselves for growth and development in academic realms.

The process of implementing per review has wide variations; however, it still benefits student learning. For example, it improves learner's conceptual understanding, reduces student attrition in challenging courses, improves attendance rate, reduces chances of failure and bolster student's engagement in classroom activities. Working with other students help them to verbalize explanations which generate new knowledge wherein they can create a common representation of the problem and answer. The research of Liang & Leng, (2023) highlights that peer review promote student's metacognitive process in which they can detect as well as correct errors themselves. Hence, as compared to individual learning, students can create more new knowledge and better explorations of answers. Focusing on self-reflection also increases student's confidence; therefore, it draws them to come up with coherent or compelling answers. Emphasizing on own's as well as other's work gives experience on assessment process; hence, students become more knowledgeable. On the other hand, metacognition ability also develops among the learners while they review writings; hence, they give more importance to focus on ways to grow academically. It not only encourages the learners to come up with right solutions but also it promotes innovative and creative ideas while writing (Liu et al., 2023).

### **Assessing the Assessors: Evaluating the Quality of Peer Feedback**

From the aforesaid discussion, in peer review students assess others work; however, it is also vital to evaluate the quality of peer feedback in terms of analyzing reliability, accuracy and fairness. Hence, the one who is assessing must know all the criteria and guidelines while reviewing others. Therefore, in the process of peer review, assessing the assessor is also required to validate the authenticity of feedback (Mansurjonovich & Davronovich, 2023). The feedback given by the peer must be realistic and related to the knowledge and skills of the students so that suggestions can be implied in future course. The validity of any assessment is depended upon the inferences one draws by evaluating work of others. In order to evaluate the quality of peer feedback, it is essential for the instructor to check if the assessment has been performed considering all guidelines and rubric. This is mandatory in terms of identifying if all criteria have been fulfilled to provide feedback to fellow student's work. Also, the instructor must ensure that the assessor knows details about the assessment process along and that the feedback is aligned with the objective of the task (Latifi, Noroozi & Talae, 2023).

## **SECTION SIX: CASE STUDIES AND PRACTICAL APPLICATIONS**

### **Real-World Examples**

#### **Case Study One**

In Florida Atlantic University, student peer review process has been implemented in terms of improving student's quality of essay writing. It includes evaluating other student's work with clear rubric and guidelines that also helps the students to learn as well as identify critical elements that are essential for academic writing. This further assist them to apply the same aspects in their own writing papers. From the case study, it has been identified that the experience of giving feedback to fellow students increases their ability to write higher quality essay and that also impacts their understanding level about areas of improvements (Vallejo, 2023). However, the case study also shows that students do have negative opinion about getting reviewed from peers (as they do not consider them qualified to perform assessment process). From the survey, 17.6% students have stated that evaluating other's work has much relevance with writing instruction; hence, it helps them to retain learning skills. They have also noticed positive changes in the learning journey especially while working with partners on different topics (Vallejo, 2023). Also, teacher's work burden is minimized to a greater extent especially when students can reflect on their writing abilities.

#### **Cast Study Two**

Student peer review process is also conducted in the Hong Kong Polytechnic University (HKPU) wherein assessment is based on evaluating English writing papers of students. As per the course, students are asked to write drafts on different areas such as reviewing a book, writing application letter and proposing a project in English language. Afterwards, students worked in pairs, and they reviewed each other's work. The process of review lasted for around 30-40 minutes and after receiving the feedback students redrafted their essays considering the comments of the peers (Lee, 1997). Therefore, conducting the process, it has been analyzed that, students not only helped each other to improve their writings but also, they learned to appreciate each other's work in positive way. Also, the students expressed in the interview that they enjoyed the process because it provided them the opportunity to share their ideas through discussions. Also, they expressed that liked their writings to be assessed by their peers as that was more encouraging and supportive.

### **Analysis of Feedback and Outcomes From Peer-Reviewed Activities**

It is important to acknowledge peer feedback quality as students are not expert in analyzing and reviewing their own work. Also, due to lack of expertise and knowledge, many raises question on reliability of peer reviewed activities. The article conducted by He & Gao, (2023) examined peer feedback quality and its impact on students. Therefore, the analysis was measured according to a self-designed two-dimensional measurement scale which analyzed two aspects such as accuracy and revision potential. From the study, 110 students revealed that peer review feedback accuracy is at medium level and revision potential is also at low level. In this respect the study highlights the importance of providing instructions and training to the students in terms of providing effective feedback that can work for improvements. It says that most

## ***The Power of Peer Review***

of the students need elaborated feedback with concrete suggestions which can be helpful for writing. However, due to lack of expertise in evaluation areas, most of the students fail to provide apt feedback (Alqodsi, 2023). On the other hand, the study reveals that while receiving feedback from peers, students tend to revise their writing which promotes improvement in the learning.

## **Lessons Learned and Recommendations for Educators**

Though peer review activity among students is popular; however, it is essential for the instructors to come up with right solutions to overcome all the associated challenges. Often the question related to validity, reliability and fairness of peer feedback appears; therefore, it is vital for the educators to make the assessment guidelines clear. However, it has also been observed that most students do not like other students to review their work since they rely only on educator's evaluation (Nguyen & Habók, 2023). Hence, teachers need to motivate the students regarding peer review that it is not merely an activity of assessment, but it encourages collaboration and teamwork. It guides students to help each other by suggesting different ways of solving a problem. Also, teachers must ensure that peer review process creates learning environment and not competitive. Henceforth, the overall process should add positive benefits to student's learning and development and make them confident inside or outside classrooms.

## **Challenges in Peer Review Process**

**Lack of expertise-** Apparently, issues might appear in student peer review process as students do not have level of expertise in assessing other's work; thus, it can lead to unfair assessments. Also, some students have the knowledge to review or provide feedback; however, not all students know the right ways of reviewing papers (Cheong et al., 2023).

**Lack of accountability-** If students do not take the process of review seriously then they might come up with incomplete or superficial reviews. Hence, it could impact the effectiveness of the review process.

**Conflict of interest-** The objectivity of peer review process could be affected if the students assess the papers based on personal relationships or conflicts (Gallagher & Savage, 2023). For example, students will hesitate to provide honest feedback to their friends considering the consequences on personal relationship.

**Time constraints-** Students are always loaded with lot of academic work; hence they might feel overwhelmed with the extra workload of assessing other's papers (Banister, 2023). Thus, it would impact the effectiveness of assessment, or it can also diminish the quality of feedback.

## **How it Can Be Addressed**

**Providing clear and concise guidelines-** It is essential for the teachers to communicate with the students regarding guidelines and criteria which needs to be followed to conduct evaluation. Also, teachers can conduct workshops that offers diversified ways to assess writing papers.

**Promote accountability-** In order to develop accountability aspect, peer review process should be considered as an important component which has direct impact on overall grades. However, students can always discuss with peers about the feedbacks if any confusion persist (Collier, 2023).



**Fairness in feedback-** Students often choose friendship over honest feedback on papers; however, teachers must encourage them to give fair feedback to minimize biases and potential conflicts. Also, another way is to maintain anonymity while reviewing peer's work.

**Providing enough time-** Students should be provided enough time to maintain all their works including peer review activity (Chambers & Harkins Monaco, 2023). For example, the activity should be conducted along with classroom exercise so that extra time is not required.

## **CONCLUSION: THE FUTURE OF PEER REVIEW IN EDUCATION**

The peer review process brings transformation in student learning as it typically builds problem solving skills through which they identify areas that need improvement and accordingly they make constructive changes. Peer review has been widely used as a practice that encourages reflection; hence, it promotes skills like self-assessment. From the study, it has been observed that peer assessment amends student motivation by nurturing the sense of responsibility and ownership for peer's learning. For example, most of the students analyze mistakes and errors on their own part; hence, the dependence on experts and teachers reduces. Thus, the discussion clearly states that engaging in the process of formative assessment not only improves academic outcomes but also it produces structured interaction among students.

In blended learning environment, the application of peer assessment is increasing because it motivates and encourages learners to evaluate the performance and learning on continuous basis. In digital and blended learning environment, assessment can be done through using different methods wherein students can be provided assessment tools through which they can provide feedback on fellow student's work. At the same time, after the pandemic, there has been a shift in education industry wherein classes and sessions are conducted in blended way; hence, peer assessment can also be performed to promote the scope of blended learning environment.

In schools, the culture of peer-led learning is gaining popularity as that not only helps students to become independent but also it makes them responsible evaluators of their own learning. Teachers as well as instructors are promoting peer-led learning to increase collaboration among learners, and it also gives them the opportunity to share their creative ideas and suggestions for better academic outcomes. This has been assisting the students to learn new perspectives and gain better understanding which improves their overall learning journey.

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# Chapter 17

## Assessing the Unassessable: Breaking New Ground With Holistic Student Evaluations

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### ABSTRACT

*This chapter offers an in-depth analysis of holistic assessment frameworks in educational systems, accentuating the critical role of non-academic skills—including emotional intelligence, cognitive flexibility, and interpersonal communication—in student development. It acknowledges the inherent difficulties in quantifying such complex competencies and introduces cutting-edge, technology-driven evaluation techniques designed to seamlessly integrate into current educational practices. By examining real-world case studies, the narrative showcases how these progressive methodologies are being applied in diverse educational contexts. It underscores the imperative for educators to broaden their evaluative scope, ensuring that students not only excel academically but also develop the essential soft skills needed to navigate and succeed in the multifaceted challenges of the future. The chapter serves as a pivotal reference for stakeholders in education reform, advocating for a balanced approach to student assessment that aligns with the evolving demands of the 21st century.*

### INTRODUCTION

Holistic assessment is a comprehensive approach for evaluation which considers emotional, cognitive and communication skills of learners. The main aim of conducting holistic assessment is to understand student's strengths, weaknesses as well as areas of interest. In modern education, holistic assessment is vital as that helps the teachers to identify what the students are grasping from the classroom activities and how it is impacting their learning journey. Assessing all the areas assist the teachers to come up with personalized learning programme for the students which further meets individual needs of the learners. Nieminen, (2022) in this context says that holistic assessment is a person-centred approach in which educators focus more on leveraging student's abilities in different contexts so that they can reach specific

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## ***Assessing the Unassessable***

goals and outcomes. It encourages the students to progress at their own pace and explore the subjects they are interested in so that they can develop deeper understanding of the knowledge they wish to achieve.

Non-academic skills hold vital importance for students as it develops self-regulation, communication and time management skills which prepares them to reach their highest potential. Traditional assessments are based on summative evaluations such as tests and exams that are conducted as per the instructional units. As per the study of Christen et al., (2022), standardized assessment fails to consider individual learning styles and pacing; thus, it is inadequate in meeting diversified learning needs of students. However, it is important to get an idea about what students are learning and how they are perceiving academic as well as non-academic aspects as this has a direct impact on real-world settings.

The main aim of conducting the chapter is find out the importance of non-academic skills in student's success and how this impact educational and career outcome. In addition to this, the chapter also sheds light on challenges in assessing non-academic skills. The role of technology in facilitating holistic assessment is also mentioned in the chapter along with innovative methods and techniques used for evaluation of non-academic skills. Lastly, discussion has been included regarding steps that schools need to undertake to integrate holistic assessment alongside academic performance metrics.

Considering the recent research of Luo & Chan, (2023), it has been found out that over past two decades, China is seemed to formulate couple of reforms and policies in the area of student's holistic development. The main purpose of formulating the policies is to equip the students and to develop their skills so that they can be prepared for complicated and unpredictable future. Under the suzhi assessment scheme, school administrations and educators focus on cultivating holistic development of students by emphasizing on variety of competencies which are essential for their personal and professional life as it helps in developing interpersonal skills, resilience as well as teamwork. Therefore, along with China, other countries are also emphasizing on the implementation of holistic assessment for student's performance evaluation.

## **SECTION ONE: THE LANDSCAPE OF NON-ACADEMIC SKILLS**

### **Definition of Non-Academic Skills**

The phase of education is changing in current times wherein children not only need to learn information and academics but also, they need to develop skills that can help them grow as successful adults (Bataneh et al., 2022). However, there is no universal definition for non-academic skills, but it generally includes attitudes and values, social and emotional skills, creative as well as metacognitive skills. Non-academic skills emphasize on soft skills wherein students need to know the importance about time management, developing proper communication with others, empathy, teamwork and managing emotional aspects (Harlan, 2023). Both academic as well as non-academic skills play different role in student's lives as it teaches them plenty of crucial things that are vital in reaching the success. For example, outside the classroom when students meet and interact with each other, they get the opportunity to share their personal ideas as well as thoughts on specific matters which further improves their understanding level. This impacts their critical thinking and problem-solving ability which is necessary for academic and professional development (Mantai et al., 2023).

## **Role of Non-Academic Skills in Student's Success in the 21<sup>st</sup> Century**

All the above-mentioned non-academic skills are key to student's academic and career success whether they are learning online or in-person. For example, self-regulation is one of the crucial skills which helps the students to think and plan about their studies; hence, they can keep up with their assignments themselves. This skill also benefits the students to make short-term or long-term goals which they can achieve in due time. According to Cooney & Sjöberg, (2022), in 21<sup>st</sup> century, it is important for students to emphasize on time management whether it is learning new things or improving the existing knowledge. Non-academic skills teach the students to prioritize as well as balance their studies and social lives. For example, students are being guided to focus on scheduling so that they can manage deadlines, and this is also an important skill which works in both personal and professional life. Communication is the most important ability which students need to develop as that assist them to collaborate with other learners wherein they can share their creative ideas and opinion (Bender, 2023).

Social and emotional skills are extremely significant for students to develop in their academic journey since it teaches them about ways to interact with one another. This not only helps the students to know about how to treat each other but also, they learn ways to address each other's needs. Henceforth, learners must have social life in which they should interact and communicate with each other which eventually makes them confident to face the world. Also, with the help of emotional skills, students understand their peers; hence, they can extend emotional support when needed. Encouraging social life develops networking which later promotes career building opportunities for the students (D'Cruz, Kidder & Varshney, 2022). In addition to this, non-academic skill also inspires the students to develop growth mindset in which they try to excel in their studies; thus, this creates competitive learning environment in the schools.

## **Impact of Non-Academic Skills on Long-Term Educational and Career Outcomes**

The study of Thompson, Rongen, Cowburn & Till, (2022) reflects that non-academic skills have been associated with variety of positive outcomes which includes improved educational achievement and development of lifelong skills that amends career building opportunities. It teaches the student to use technology in appropriate way which is the most important skill in 21<sup>st</sup> century (AlQodsi & Aljahoori, 2023). Students must develop the ability to use digital tools as that not only improves academic standards but also it helps in designing the workload appropriately. For example, using digital tools can help the learners to access online research materials and courses which underpins overall learning aspects (Spruce, 2023). Apart from this, digital tools also provide additional materials and resources for the students which they can make use of during in career options.

In non-academic area, time management and organization skills are most important since it develops the ability to manage things on time and in organized manner. For example, students must make reminders and personal calendars to manage the deadlines and submission. Also, the project work and other related tasks must be organized properly to avoid any confusions and mishaps. Furthermore, developing all these skills encourages career opportunities as it makes the individuals equipped with diverse skills and abilities (Chan & Luk, 2022). Also, in current scenario students need to be prepared about future long-term goals; hence, this can only be possible through focusing on building non-academic skills.

## ***Assessing the Unassessable***

Moreover, learning about emotional intelligence is crucial for the students as that helps them to understand the emotions; thus, it prevents them to disrupt learning (Alqodsi et al, 2023).

## **SECTION TWO: CHALLENGES IN ASSESSING NON-ACADEMIC SKILLS**

### **Why Non-Academic Attributes Are Difficult to Measure**

In education sector, non-academic attributes are difficult to measure because they are often considered subjective and multifaceted in nature. Also, non-academic skills like leadership and creativity aspects are subjective in nature and is also interpreted differently by people (Qablan et al., 2023). Hence, due to difference of interpretations, people perceive it differently and may find it challenging to relate with the situation (Parker, Thomsen & Berry, 2022). On the other hand, non-academic skills include certain capabilities which cannot be measured in clear way as teacher's main criteria of evaluation is based on academic performance metrics. Often overlooking non-academic skills impacts the overall evaluation process as teachers focus only on academic achievements; therefore, the skills of students remain unutilized and unobserved. Educators are accountable to sharpen the skill level of students (Qablan & Al-Qaderi, 2009); however, their unawareness about non-academic aspects leads difficulty in measurement (Gallegos et al., 2022). In addition to this, most teachers do not receive proper trainings on how to assess non-academic attributes; hence, without proper guidance they are unable to develop reliable and valid assessment.

Chan & Chen, (2022) in this regard says that in order to measure non-academic skills schools must have tools as well as personnel to implement comprehensive assessment process; however, lack of these facilities affect the overall evaluation process. Most schools do not implement holistic assessments as they are not ready to use additional resources. Moreover, education systems typically emphasize on standardized evaluation based on subjects and coursework; thus, it leaves little room for assessing non-academic skills. It has also been identified that non-academic skills are not considered in the learning process as it is treated separately from core curriculum; hence, teachers do not include that in assessment procedure (Alqodsi., 2023).

### **Subjective Nature of These Skills and the Risk of Bias**

According to the study of Pocaan, (2022), evaluating non-academic skills could be associated with the risk of bias as it does not have any standardized method of measuring competencies. Since, it is different from academic aspects, it becomes challenging for the educators to quantify the evaluation objectively. Also, the perception and interpretation of people is different; hence teachers usually struggle to differentiate between positive and negative aspects. For example, clear communication is often considered as effective in improving team dynamics; however, others can take it as aggressive which affects the interest of people (Žuljević & Buljan, 2022). Every assessor has personal preference in evaluating certain soft skills; therefore, it can lead to favoritism towards those students who exhibit the same attributes even if the skills are not considered universally effective (Ismail, Alriyami, & Alhosani, 2023).

Evaluation of non-academic skills require teacher's observation; hence, certain behaviors of students might not be taken positively when assessors have different view of perceiving things. Also, some observations do not cover all strengths and capabilities; therefore, it affects the overall assessment of skills,



and it can lead to come up with biased assessments based on confined information (Koenings, Peter & Uebelmesser, 2022). Lack of relationship with students is yet another factor that affect the educators to come up with right assessments as assessors must understand mental, emotional as well as intelligence level of student while giving feedback about non-academic skills. Also, lack of knowledge in teachers about how to categorize and rate non-academic skills in students is one such challenge that makes the overall assessment process complicated and all this happens due to lack of cognitive understanding of non-academic competencies (Geary & Xu, 2022).

### **Current Gaps in Assessment Tools and Methodologies**

Analysing the existing assessment strategies and methodologies, it has been identified that there has not been much attention on non-academic skills as evaluation process is entirely based on academic metrics (Martirosyan, Van De Walker & Saxon, 2022). In schools, there seems lack of standardized framework and inconsistency in assessment methods. For example, most of the schools are unclear about the guidelines that are to be considered while conducting holistic assessments. Also, non-academic skills are subjective to biasness; hence the outcomes lead to judgments which are often unreliable. In addition to this, the article developed by Thalib et al., (2022) states that non-academic skills are dynamic and dependent on context; therefore, it makes the static assessment more challenging in nature. In order to bridge the gap, it is crucial for the school administration to include assessment of non-academic skills in overall evaluation process and schools should train the teachers to emphasize on holistic assessment. Also, teachers must be trained to develop the scope of non-academic skills in student's academic journey (Ramadan & Ismail, 2023).

## **SECTION THREE: INNOVATIVE METHODS OF HOLISTIC ASSESSMENT**

### **Case Studies of Innovative Assessment Strategies in Action**

**Project-based assessments-** Assessors use this strategy in which students are provided real-world projects where they must use problem-solving and creativity skills. Here in this strategy, focus is laid on observing the whole process not just the outcome (Pillsbury-Fischler, 2023). For example, assessment is based on how students interacted with others and how they solved the problem. Thus, the assessment emphasizes on the skills that are being demonstrated during the project.

**Student surveys-** Teachers conduct student surveys wherein they communicate with them about the teaching styles and learning experience. Also, students can give their feedback about whatever improvements they expect in classroom activities. This gives students the opportunities to express about their areas of interests (Siddique et al., 2022).

**Social and Emotional Learning (SEL) Assessments-** In this approach, the evaluator focuses both on cognitive and social & emotional competencies to assess overall efficiency of performance. This results not only in providing professional learning opportunities but also it helps the students to express their mental health status (Winstone & Boud, 2022). Thus, accordingly it guides the teachers to create supportive environment for the students (Al-Zoubi et al., 2023). Moreover, students can also communicate about culturally- responsive practices and policies that are integrated in school activities.

## **Tools and Techniques for Assessing Soft Skills and Emotional Intelligence**

Soft skills and emotional intelligence are highly valued by the employers as that makes a significant difference in hiring the candidates for the job. Therefore, teachers must provide students with opportunities to develop their soft skills which can benefit them in future course. Apart from developing such skills, soft skills need to be assessed to understand how individuals will manage own as well as other's emotions. According to Almeida & Buzady, (2022), EI (emotional intelligence) tests are standardized assessments that measure individual's level of emotional intelligence based on their responses given on certain questions and scenarios. Often, self-report tests and ability-based tests are also conducted to know the emotional level; however, it can be costly as well as time-consuming (Demchenko et al., 2022). Soft skills are highly essential especially when the candidate is giving job interviews; hence, companies undertake cognitive ability tests as well as personality questionnaire test to identify the capability of the person of using such skills in right areas.

Teachers can also conduct behavioural interviews wherein students are asked to describe the situations in which they can use their EI skills. This way their emotional intelligence level can be analysed along with how they make their decisions in different circumstances (Jahan et al., 2022). Another technique that can be used is role plays in which candidate can be put in a realistic scenario where they must interact with others and deal with the challenge using their soft skills. Reflective journaling is a technique that can be used to assist the students develop their self-awareness and emotional intelligence as they write down or share their thoughts as well as experience about specific incidents. This is an effective technique which assist the students to recognize their own strengths and weaknesses; thereby, it can improve their soft skills (Widad & Abdallah, 2022). Moreover, they can also become aware of managing their emotions, build resilience and develop positive mindset which is essential in balancing personal as well as professional lives.

## **Incorporating Self-Assessments, Peer Assessments, and Teacher Observations**

The most common ways of assessing student's soft skills and emotional intelligence level are teacher observations, peer assessments and self-assessments. Teachers put the students in group activities and simulation projects in which certain scenarios are given along with a problem. As per the project, students are required to work together and achieve a common goal that is effective to both the individual and their team (Volkov et al., 2022). Teacher usually observes how well students are collaborating and communicating with each other in the teamwork. By working in a group, students develop the ability to listen to others and provide constructive feedback and this is also significant in building strong relationships with their peers (Abdallah et al, 2023). Thus, teachers put them in a place where they identify the best methods to solve the problem along with the team. Teacher observes on continuous basis and gives feedback accordingly to the performance aspects under the holistic assessment process (Escolà-Gascón & Gallifa, 2022).

Peer assessment is another technique in which fellow students gives feedback about others regarding how they felt working with the specific student in a group. In holistic assessment, instructor also asks the students to evaluate or assess fellow student's writing paper and give appropriate feedback on their work (Salamzadeh, Tajpour & Hosseini, 2022). This helps in increasing the understanding level and students also learn diversified perspectives of the subject matter. Henceforth, it works as a structured

learning process for the students wherein they critique and provide feedback to each other on their work. It develops lifelong skills and equips them to self-assess and improve their own work (Kilag et al., 2023). Peer assessment plays an important role in holistic evaluation as it specifies how well the individual acted or behaved with others while working with them in a group. Thus, intelligence level, emotional level and communication all are assessed in one process. Along with this, self-assessment is also important to be included in holistic evaluation as in this technique, students themselves evaluate their own work and improve the respective areas (Muñoz et al., 2022). Through this technique, students identify their own mistakes as well as errors; hence, this assists them to come up with appropriate solutions.

## **SECTION FOUR: TECHNOLOGY AND HOLISTIC EVALUATIONS**

### **The Role of Technology in Facilitating Holistic Assessments**

In order to assess student's overall performance, teachers are using technology on wider extent as it is a powerful tool which provides immediate feedback and data about student's learning (Badawy & Alkaabi, 2023). It also informs instruction and learning and provides personalized assessment about learner's needs, goals and preferences (Marks & Al-Ali, 2022). In current scenario, technology has been used to assess learner's skills, knowledge and attitude as that advances the opportunities of achievement. Also, technology gives appropriate idea about how students are performing in the classes as well as outside the classes (Ibrahim et al., 2024). For example, there are several quizzes and tests that are performed through digital platforms wherein students not only give feedback about classroom teaching but also, they specify their personalized learning needs (Almeida & Morais, 2023). The use of technology has been started in assessment process as creating assessments and grading individually is a time-consuming process; however, with digital tools teachers can better understand the learning level of students (Abdallah & Alkaabi, 2023).

With the help of technology, teachers can provide timely feedback or quick responses on student's performance through assessing their performance level on different tools (Khalil et al., 2023). In addition to this, teachers can also save the data in the spreadsheets and emails with specific formats which will eventually come up with appropriate assessment (St-Onge et al., 2022). Using technology, teachers can also provide suggestions as well as personalized learning experience to the students in accordance with their needs. However, traditionally teachers used to use manual reports and data analysis method in terms of evaluating the performance of each student which was not only a time-consuming practice, but it had certain accuracy related issues (Abdallah & Farhan, 2023).

### **Technological Challenges in Implementing Holistic Assessment**

**Lack of teacher training-** In order to conduct holistic assessment through technology, it is required for the teachers to use various technological tools; however, lack of knowledge about such tools create challenges while conducting holistic assessment. Most of the school administrators focus only on academic performance evaluation; hence, they merely evaluate the academic grades through manual procedures (Baidoo-Anu & Ansah, 2023). This not only limits the scope of holistic assessment; but also, evaluation of other skills remains unidentified (Alkaabi, 2023; Alkaabi et al., 2023; Alkaabi, 2021; .

## ***Assessing the Unassessable***

**Solution-** Though additional resources are required to train the teachers; however, schools need to focus not only on implementing holistic assessment but also guiding the teachers about using the right techniques to evaluate student's diversified skills (Almaktoum & Alkaabi, 2024). This way teachers can also strengthen their competencies by sharpening the identified skills.

**Ethical and legal concerns about privacy-** Apparently while performing any activity through technology, the issues related to data privacy and ethical aspects appear. It is highly essential for the educators and administrators to protect the data in secured database so that to limit the access to authorized people only (Salamzadeh, Tajpour & Hosseini, 2022).

**Solution-** School administrators must focus on data privacy and ethical policies while preparing assessment sheets so that only reliable information can be included in the evaluation process.

**Diminishes the role of human judgement-** Most of the educators believe that performing assessment through technology reduces the interaction between students and teachers. Apparently, educators believe that giving direct feedback to the students about both academic and non-academic skills is necessary to improve the understanding of overall skill development (Escolà-Gascón & Gallifa, 2022).

**Solution-** Along with technology, teachers can be encouraged to give direct constructive feedback to the students as that will maintain student-teacher relationship which has a positive impact on learner's overall development.

## **Advancements in AI and Machine Learning for Evaluating Student Engagement and Participation**

The drastic impact of Covid-19 pandemic is visible in all aspects of life including education. This has emerged the use of e-learning and digital platforms for remote teaching. Hence, in the same manner, teachers are also using AI and machine learning to evaluate student's engagement and participation level in classroom and other academic related activities (Alam, 2022). For example, there has been a use of novel deep learning-based algorithms which monitors student's emotions like as anger, disgust, sadness, fear and happiness. This is being managed by state-of-the-art algorithms which compute the Mean Engagement Score (MES) and analyses outcomes based on facial landmark detection and emotional recognition (Qadir, 2023). Also, teachers promote the use of AI-driven chatbots which act as virtual therapists and helps the individuals to identify their learning needs and get immediate support through accessing diverse resources and materials (Abdallah & Alkaabi, 2023).

On the other hand, Chen et al., (2022) says that Convolutional Neural Networks (CNN) have also been used by various educators for improving the engagement detection of students. It identifies student's engagement as well as their interest level in classroom activities. Students usually interact when AI tools are used in assessment processes as this gives them the opportunity to present their opinion and feedback on teaching styles. School administration also creates Google Forms as this is a widely used student assessment tool wherein teachers include multiple choice questions in the survey and ask the students to respond accordingly. (Chen et al., 2022). This survey-based assessment is helpful for the teachers to identify and keep track of student's progress about individual subjects. Thus, it plays a crucial role in conducting holistic assessment of student's overall progress as well as areas of improvements (Darawsheh et al,2023).

## **The Use of Digital Platforms and Simulation-Based Assessments**

AI as well as Machine Learning (ML) techniques have been prominently used to solve diversified issues related to different industries; hence, its applications have greatly contributed to the betterment of the society. In the same way, in the present era where education system is based on online teaching and smart classroom concept, AI and ML effectively helps in imparting quality education (Baidoo-Anu & Ansah, 2023). It helps the teachers to come up with innovative ideas and suggestions which they can use while evaluating the performance of their students. For example, intelligent tutoring system is one such method that is being adopted to match the teaching styles with learning needs of students and eventually it contributes to student's academic progress. Thus, it can be said that machine learning being a subset of AI is gaining popularity in educational sector. Educators are also using simulation-based assessments in which students are given practical as well as challenging real-life situations where they can integrate their knowledge, skills and competencies (Maki, 2023). This way teachers can observe how students apply their knowledge in practice; hence, accordingly improvement plans are formed for better academic achievements.

## **SECTION FIVE: IMPLEMENTING HOLISTIC ASSESSMENTS IN EDUCATIONAL INSTITUTIONS**

### **Steps to Integrate Holistic Assessments in Schools**

Assessment is important part of education as it allows the educators to make judgments on learner's skills, knowledge and understanding. As per holistic assessment, teachers can tailor academic activities according to student's needs (Stevens & Levi, 2023). Therefore, under holistic assessment, assessor can gather evidence for several evaluation criteria in multiple units in a single assessment process. Underneath are some steps that can be integrated to conduct holistic assessment in schools-

- **Assessing learning that occurs in multiple locations-** It is essential for the assessor to evaluate how the students are learning inside or outside the classrooms. This additional look is important to understand the learning patterns of students; hence, accordingly changes can be made in the overall teaching plans (Svensäter & Rohlin, 2023).
- **Assessing beyond cognition-** Assessing non-academic as well as soft skills is also vital along with academic skills learned since it helps in understanding student's interest and participation in development activities. Teachers must conduct sessions with the students to know about their thoughts and feelings. This is crucial to understand the mental mindset of students and how well they can implement their learnings.
- **Assessing from multiple perspectives-** Teachers should use multiple perspectives while evaluating the performance of students such as academic progress, emotional and intelligence level, health aspects as well as psychological aspects. During the academic journey, holistic assessment is crucial so that to gain insights about multiple dimensions of learner's development (Cook & Kaplan, 2023). Also, at the same time, teachers can identify opportunities for transferable skills which benefits students in professional area.

## **Training Educators to Effectively Evaluate Non-Academic Skills**

- **Analyzing attitudes and values of students-** Educators should evaluate non-academic skills through assessing social and emotional level of students along with the way they make their decisions. For example, teachers should observe and monitor the way students communicate with each other and accordingly right suggestions can be provided for improvements (Almeida & Morais, 2023). Also, communicating with the learners can help the educators to know the values and principles students consider in academic journey.
- **Emphasizing on the significance of non-academic skills-** It is essential for the educators to promote the importance of non-academic skills by communicating its significance for student's overall development. Practical examples can be provided to introduce variety of non-academic skills in real-life scenarios.
- **Providing multiple opportunities to use skills-** Teachers should put students in different scenarios and they must also provide multiple opportunities to learners wherein they can utilize their skills and competencies (Escolà-Gascón & Gallifa, 2022). This is one of the effective ways of analysing student's strengths and capabilities and how well they can use it while collaborating with others. Also challenging projects can be delegated to the students so that to identify their metacognitive ability.
- **Involving the students in role plays and group projects-** Teachers should involve the students in role plays and group activities which are related to real-life aspects wherein they can evaluate the existing skills along with those needed for improvements. Also, teachers should use surveys and interactive tools to assess the performance of students (Volkov et al., 2022).

Henceforth, from the discussion it can be said that educators should be trained to encourage peer reviews and discussions about non-academic assessments as that helps in getting in-depth understanding about overall evaluation criteria.

## **Drawbacks and Challenges of Holistic Assessment**

- **Under emphasis on academic learning-** Often over emphasis on non-academic and soft skills diminishes the value of academic learning. For example, along with non-academic skills, students need to focus also on academic students as that helps them setting their career and learning journey (Su Ng & Chu, 2023).
- **Time-consuming-** The process is time-consuming and expensive as additional resources are required to be invested. For example, in order to evaluate non-academic skills, schools must make arrangement of extra circular activities which requires huge resources and time.
- **Does not fit with school curricula-** Most of the school focus only on the academic aspects; hence the curricula are embedded with math, science and literacy elements (Baidoo-Anu & Ansah, 2023). Therefore, in the education systems, often it becomes difficult for the teachers to include holistic learning opportunities into the classroom activities.

## **Ways to Overcome the Challenges**

- **Developing balanced approach-** For school administrators, it is essential to develop a balanced approach wherein focus should be laid on both academic and non-academic areas. For instance,

teachers must communicate with the students about developing soft skills as that hold important place in future life (Cook & Kaplan, 2023).

- **Involvement in extra activities-** It is essential for the educators to involve the students to extra activities that is helpful in building their skills and it also makes them learn new things which are essential in different areas of life.
- **Balancing with academic curricula-** In the competitive era, it is vital for the schools to focus on building competency of students so that they can get right opportunities for their career. Therefore, focus should be laid on including all aspects of learning (Almeida & Morais, 2023).

## **Balancing Holistic Assessments With Academic Performance Metrics**

It is essential for the education institutions to integrate holistic assessment with academic performance as that is essential in determining overall child's development. Education should not be just academic; however, it must include non-academic areas (social, emotional and physical development) also to promote comprehensive growth of students. In this respect, it has been identified that Montessori Education (a primary school) strongly emphasizes on balancing academic and non-academic development of students; thus, it focuses on every area of life which contributes to learning diversified things (Not Just Schools, 2023). It provides opportunities wherein teachers can identify as well as nurture each student's strengths and talents.

Holistic assessment is also necessary because it develops opportunities for the students to excel in various domains such as art, community service and physical education. Also, learners can explore new things by focusing on additional skills. Educators are conducting holistic assessment because it holds crucial value beyond the classroom, and it also ensures that all areas are given appropriate attention. The study of Mantai, Swain, Bearman & Brew, (2023), in this respect says that balancing academic and non-academic assessment helps the students as well as teachers to discover new things that eventually improves learning experience. Therefore, concluding it can be said that a balanced approach is vital because along with academic, non-academic skills are equally important for overall wellbeing of career (Abdallah et al., 2023).

## **SECTION SIX: CASE STUDIES AND REAL-WORLD APPLICATIONS**

### **Profiles of Schools and Programs Using Holistic Assessments**

Assessing the progress level of student is an important aspect of education system; hence, considering this Montessori Education adopts holistic evaluation approach which gives clear understanding about overall child's development (Not Just Schools, 2023). The holistic assessment approach of Montessori Education includes the following aspects-

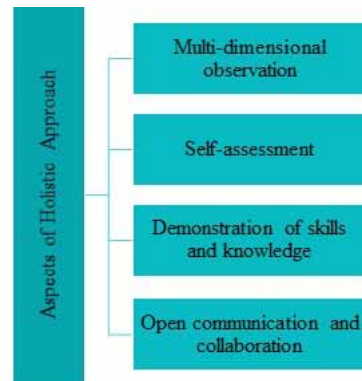
**Observation-** Teacher observes student's learning styles and interest to analyse the academic performance.  
**Self-assessment-** Students are told to evaluate their own progress level; hence, it develops critical thinking and growth mindset (Not Just Schools, 2023).

Montessori Education uses interactive tools which promotes student's engagement in learning new skills.

## Assessing the Unassessable

**Focus on social and emotional development-** The assessment approach evaluates student's emotional wellbeing as well as ways in which they interact socially.

Figure 1. Aspects of holistic approach



In addition to this, Montessori Education emphasizes on Holistic development approach wherein focus is laid on multi-dimension observation that includes analysis of academic progress, problem-solving abilities and development of lifelong skills. Teachers also keep track of every student's achievement; hence, it is useful in facilitating further support. Moreover, students are also handed specialized learning materials which helps them to demonstrate their skills in practical areas. Furthermore, the school also encourages open communication between students, teachers and parents to remain updated about child's overall progress. Therefore, it can be said that these key principles improve the value of assessment process and assist the school to highlight each student's capabilities (Not Just Schools, 2023).

Shanghai Singapore International School (SSIS) implements holistic assessment method in which formative as well as summative evaluation is being embedded to provide feedback on student's overall performance. For example, for grade 1-3, the school implemented range of evaluations such as class work and tests which gives clear understanding about how students are progressing in academic areas (SSIS. asia, 2022). Further, from grade 4-6 team of specialists conduct the assessment process in which academic as well as non-academic skills are identified. For example, they measure student's growth and progress rate and accordingly it helps in formulating teaching and learning plans. Conducting the MAP (Measures of Academic Progress) test assist the teachers to gain factual data which further can be used to benchmark growth level in students (SSIS. asia, 2022).

## Analysis of the Outcomes and Benefits Experienced by These Institutions

Implementing holistic assessment in education institutions assist the teachers to become aware about individualized learning needs of students by noticing their academic and non-academic performance. Hence, teaching strategies can be improved accordingly that meets the needs of students which improves overall learning environment. Also, providing real-life case scenarios would encourage critical thinking ability of students as they are able to think critically and solve the problem effectively (Nieminen, 2022). Schools implementing holistic assessment have stated that it promotes creativity to a greater extent be-



cause it allows the students to come up with innovative ideas where they can implement broader range of skills. It is essential for the schools to give importance to extracurricular activities as that helps in developing new skills which are essential for labour market (Abdallah & Abdallah, 2023).

In this respect, the Hawaii Department of Education has developed the Hawaii Multi-Tiered System of Support (HMTSS) in the form of holistic assessment which emphasizes on overall child development. It allows the students to present their opinion and feedback about diverse aspects through perception surveys and SEL student surveys. Conducting the survey, the school found out that students can describe their feelings about how they feel in classroom and extra activities. Considering the study, it has been identified that Hawaii's multi-tiered system supports in amending student's knowledge and skills ([ies.ed.gov](https://ies.ed.gov), 2021). This further helps the students to select the right courses and plans for their future. Thus, it leads direct impact on amending academic performance metrics. It is important for students to speak about their emotions level as that impact their learning mindset and performance level.

Students feel positive when they have someone with whom they can share their feelings and thoughts. This helps them to seek counselling for both academic and career areas. Furthermore, connecting with teachers and other people increases growth opportunities for students and they become players for the job market. There are many areas in which students wishes to talk; hence support from teachers, peers and parents assist them to open about the struggles and establish new mindset for future activities (Christen et al., 2022). For example, in holistic assessment focus is also laid on student's mental and physical health; therefore, especially in higher education it is important to analyze if students are fine with the pressure of the studies in terms of realizing their health aspects.

## **Lessons Learned and Best Practices Gleaned From These Examples**

From the above discussion, it is identified that holistic assessment comes with lot of benefits, and it helps both the teachers and students to evaluate the learning level along with existing challenges. One of the significant aspects of adopting the approach is that it develops effective relationship between teachers and students; hence, both can share their thoughts and expectations. This is imperative to improve the overall learning experience (Mantai, Swain, Bearman & Brew, 2023). However, often assessing non-academic skills leads to biased evaluation; therefore, certain criteria must be specified while evaluating overall performance. However, assessment should not be an annual practice and it must be conducted within two-three months to maintain consistent improvements. Also, teachers must involve students and communicate with them in all aspects in terms of giving constructive feedback on their performance.

## **CONCLUSION**

From the above chapter, it is concluded that implementing holistic assessment in educational institutions is essential since it gives detailed idea about student's overall wellbeing. Schools have been integrating holistic assessment as educational scenario has been changing and focus is being laid on developing and improving student's performance dynamics. The study articulates that non-academic skills help the students to develop diverse skills and prepare them to achieve the defined goals. It also develops chances of getting better opportunities for improving the career aspects along with academic intelligence. However, at the same time, assessing non-academic skills is also a challenging process as not every school knows the right steps to analyse it.

Therefore, teachers are to be trained to evaluate non-academic skills by integrating technological aspects. This study reached a conclusion that schools which implemented holistic assessments gain better outcomes such as improved student learning as well as supporting the students to develop competencies that extend beyond academic performance. In addition to this, the use of technology in assessment process assists teachers to receive participation from students which in turn develops collaboration among learners and educators; hence, leads to better outcomes. Thus, it can be concluded that holistic assessments are useful in supporting overall learner development and it also improves the scope of evaluation process.

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# Chapter 18

## The Role of Assessment in Driving Continuous School Improvement

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### **ABSTRACT**

*Assessment plays a pivotal role in the school improvement in ensuring its effectiveness, continuity, and impact. Equally important is the utilization of reliable data that enables schools to identify, address and achieve desired improvements. The chapter explores the role of assessments and the use of data in the continuous school improvement process, and examines assessment practices, professional collaboration and assessment literacy that contribute to positive changes in schools. The chapter also highlights the impact of effective assessment practices in improving schools through a study of four private schools in the Emirate of Sharjah, United Arab Emirates that made significant improvement in their level of educational quality by adopting effective assessment processes.*

### **INTRODUCTION**

Effective school improvement is data-driven, with assessment playing a crucial role in setting and achieving measurable goals, as well as evaluating outcomes (Fullan, 2021). This assessment process requires schools to utilize a variety of data on student achievement and interests (Rey, 2010; Ferrer, 2010). Continuous assessment, a key to success, involves regular feedback on student learning and teaching processes, aiding in decision-making and predictive analysis for enhanced educational outcomes. The chapter examines the role of assessment in driving school improvement, focusing on four private schools in Sharjah, UAE, and their successful use of assessment strategies to improve educational quality (Schildkamp, 2022).

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## **DEFINITION OF ASSESSMENT**

Assessment in education, focusing on improving student learning and development, involves analyzing student achievement data (Banta & Palomba, 2014). It's essential for effective instruction and gauging learning outcomes (William, 2011), defined as a formal method to determine students' educational status (Popham, 2014). Beyond formal testing, assessment encompasses various methods to evaluate students' knowledge, skills, and competencies against learning outcomes.

## **SIGNIFICANCE OF ASSESSMENT IN CONTINUOUS SCHOOL IMPROVEMENT**

School assessments identify student strengths and weaknesses for personalized interventions and curriculum modifications, informing students, parents, and policymakers. They offer insights into teaching pedagogy, curricular gaps, and resource quality, guiding systemic improvements. This operational definition includes various measures like tests, quizzes, and portfolios, focusing on student progress and development. McTighe and Ferrara (2021) view assessments as learning opportunities, emphasizing principles for maximizing student learning. Similarly, Stiggins (2007) emphasizes clear assessment criteria and targets for effective learning. Despite the value of assessment data, its consistent use for improvement and accountability is limited (Fullan, 2021; William, 2011).

## **ASSESSMENT LITERACY AND PROFESSIONAL COLLABORATION**

Assessment, being one of the most important responsibilities of teachers, requires schools to consistently work on creating a culture that promotes assessment literacy and professional collaboration and inquiry. Assessment literacy is vital to ensure accurate reading, analysis, and interpretation of results to improve teaching and learning (AlQodsi & Aljahoori, 2023). Effective schools seeking reliable results in pursuit of school improvement must ensure that their teachers develop language assessment literacy and practices to avert negative consequences due to misinterpretation of results (Khadijeh & Amir, 2015). The quality of the teaching environment is inseparable from the quality of the applied assessment.

Furthermore, teachers who are assessment literate can consistently articulate and transform concrete results into informative insight that provides students a clear path for improvement. Based on extensive firsthand experiences in schools in the United States and the United Arab Emirates, Hamdan and Fradi (2023) found that effective schools have teachers and middle leaders who possess data knowledge and skills; who effectively monitor student learning; track student progress through work scrutiny; help students understand their own performance and the next steps to improve; and teachers who involve students in setting targets for their own improvement (Abdallah, 2023).

Assessment literacy necessitates that teachers and administrators exhibit competence in understanding and identifying the difference between reliable and unreliable assessments, and between flawed and accurate administration of assessments, and are capable of understanding assessment methods used to gather reliable student achievement information and to effectively communicate and use assessment results to maximize student learning and motivation (Stiggins, 2000). While the task of ensuring educators' assessment literacy and understanding of results to make informed judgement and systematic inquiry may be complex and difficult, there is no escape from the reality that basic literacy is critical for

## ***The Role of Assessment in Driving Continuous School Improvement***

continuous improvement (Earl & Katz, 2002). The suggestion of assessment literacy is not to propose that educators become experts in statistical data analysis, but rather to ensure that educators possess, at minimum, the statistical principles and basic tenets and of assessment and data interpretation. Earl and Katz (2002) suggest that being assessment literate means that educators:

- **Think About Purpose(s):** Recognize and understand that different purposes require different types of data.
- **Recognize Sound and Unsound Data:** Ability to recognize and discern the quality of data and whether it is reliable, valid or flawed and inconsistent. They understand the consequences of invalid and unreliable data, and unsupported assumptions leading to wrong decisions.
- **Are Knowledgeable about Statistical and Measurement Concepts:** Understand the principles of statistical analyses and basic measurement conventions and rules.
- **Make Interpretation Paramount:** Ability to accurately interpret data to make informed decisions.
- **Pay Attention to Reporting and to Audiences:** ability to accurately communicate and report data to students, parents and other stakeholders.

In pursuit of improved teachers' assessment literacy, schools must invest adequate professional development resources and provide teachers with opportunities to meet, reflect and exchange ideas relating to best practice and their own assessment experiences, and to ensure that professional development deepens teacher's understanding of the relationship between teaching, assessment, and testing (Berry, Sheehan & Munro, 2019). The power of collective reflection and collaboration among teachers cannot be underestimated in building teachers' confidence with a common focus toward common solutions (Schmoker, 1999). Lack of professional collaboration and teacher isolationism will impede any effort for common solutions and deepened professional knowledge including that of assessment literacy.

Within the context of teacher collaboration, establishing professional learning communities (PLCs) represents a vital venue to harness the power of collective thinking and action, which has been documented to be very influential in the process of continuous school improvement and engaging educators in reflective dialogue and critical feedback (Lee & Louis, 2019). For teacher collaboration to be effective it must extend beyond simple deliberation and discussions. Teachers are a key resource in the development of assessments and school improvement goals. A good example of this vital collaboration has been in the development of *Smarter Balanced* assessment in the United States by educators at each stage of the process from item construction to data review.

While professional development is an important factor in educators' assessment literacy, effective practices in assessment require cultural beliefs transformation among schools and an understanding of the influences that hinder teachers' involvement in data-based decision making. Prenger and Schildkamp (2018), in survey of educational literature, found that certain psychological factors (also referred to as motivational factors) influence teachers' involvement in data-related decisions. They include:

1. Affective and instrumental attitudes such as fear of making instructional modifications based on data, and teachers' beliefs on consequences and attributes of data use.
2. Subjective norms that refer to normative expectations of others. Educators who usually exhibit positive subjective norms were found to express intentions to use data more readily than others. In this context, educators are more likely to engage in data decision-making when data is considered for the purposes of improved teaching rather than for accountability purposes.

## ***The Role of Assessment in Driving Continuous School Improvement***

3. Perceived control and sense of autonomy to make data-related decisions. Teachers are more likely to engage in data-based decision-making where they feel adequate autonomy to make instructional and curricular modifications and changes.
4. Individual self-efficacy, which refers to an individual’s sense of confidence to perform desired behaviors, is an influencing factor that is positively related to teachers’ intention and confidence in data utilization. Thus, less sense of efficacy contributes to greater disinterest and lack of confidence in data use.
5. Collective self-efficacy where teachers share a sense of collective ability to achieve collective results positively influences educators’ participation in data-based activities.
6. Behavioral intentions, which play an important role, represent individuals’ motivation to perform and achieve a specific target and a willingness to learn and change.

### **USE OF ASSESSMENT DATA IN CONTINUOUS SCHOOL IMPROVEMENT**

Data serves to inform the continuous improvement process and determine the degree of achieving intended educational outcomes. This spans a wide spectrum of functions that include assessing the professional preparation and training needs, resource allocation, modification of curriculum and instructional practices, assessing and measuring the effectiveness of student academic and social support programs, measuring student progress and attainment and identifying the critical variables that impact students’ academic progress. Table 1 below provides a list of the common metrics used in school improvement, which include: student learning, demographics, school environment, implementation (Hanover Research

*Table 1. Common metrics in school improvement and their purpose*

Variables	Sample Metrics	Purposes
<b>Student Learning</b>	<ul style="list-style-type: none"> <li>●Standardized tests ●Tracking curriculum delivery and assessing alignment of curriculum standards to instruction and student assessment ●Authentic assessments ● Summative and formative assessments</li> <li>●Social and emotional learning (SEL) and wellbeing of students ●Attendance ●Drop-out rates ●Rates of students performing below, at, and above grade-level by subject area ●Rates of proficiency on local and national assessments.</li> </ul>	<ul style="list-style-type: none"> <li>●Track student achievement, attainment, and progress</li> <li>● Identify areas of improvement and achievement gaps</li> <li>● Devise plans for improvements and interventions for groups and individuals ● Ensure coherent alignment between curriculum, instruction, and assessment</li> <li>●Modification of curriculum, lesson planning and instruction ●Determine horizontal and vertical alignment of curriculum ●Obtain data on the social and emotional wellbeing of students</li> </ul>
<b>Demographics</b>	<ul style="list-style-type: none"> <li>●Enrolment ●Race ●Gender ●Special need populations</li> <li>●Neighborhood characteristics ●Mobility patterns</li> <li>●Access to transportation ●Parent involvement</li> <li>●Behavior and social problems of students</li> </ul>	<ul style="list-style-type: none"> <li>●Demographic data helps schools identify longitudinal trends and areas of needs, expectations strengths and challenges ● Provides an insight into problem areas so that schools can make appropriate interventions and accommodations.</li> </ul>
<b>School Environment</b>	<ul style="list-style-type: none"> <li>●School connectivity ●School climate/culture ●Parent, student, and teacher perceptions of school climate.</li> </ul>	<ul style="list-style-type: none"> <li>●Assessment of school climate and culture that either enhances or compromises student wellbeing, and emotional and physical safety ●Helps schools plan for improvements in school climate and culture.</li> </ul>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>●Depth of implementation achieved ●Evaluation of implementation ●School performance/inspection reviews</li> </ul>	<ul style="list-style-type: none"> <li>●Ensure rigorous and continuous assessment of the implementation of school improvement process in meeting stated goals and outcomes ●The ongoing tracking and feedback helps schools with goal setting and ensures continuous monitoring.</li> </ul>

**Source:** Adapted from Hanover Research Group, 2014.

## ***The Role of Assessment in Driving Continuous School Improvement***

Group, 2014). Collected and analyzed data can also be used to challenge untested assumptions and perspectives about instructional strategies, student learning, and choices of educational programs and initiatives. Furthermore, data is a vital element in the scheme of accountability of schools to students, parents, community stakeholders, and governmental regulators.

The commonly utilized metrics, as discussed by the Hanover Research Group (2014), are in line with earlier research on school improvement. Bernhardt (2000) proposed a data system composed of four key elements that will serve the needs of schools for an effective continuous improvement process. The four key elements are detailed as follows:

1. **Demographics:** Demographics are statistical representations of the population being served. This includes gender, nationality, race, and community characteristics. Availability of demographic data helps schools in disaggregating group data, verifying equity of services to students, predicting future trends and assisting in the identification of interventions relevant to each of the served groups.
2. **School Processes:** this is in reference to data gained and tracked from the utilization of instructional and assessment strategies and organizational measures. This may include information by grade level, program participation, retention, interventions and innovation (e.g., multiage classroom, reading recovery programs, special education, after school programs, extracurricular activities), school attendance patterns, courses completed, use of academic and social support services, drop-out and graduation rates, college participation rates, teacher certification and qualifications.
3. **Perceptions:** this refers to perceptual data gained from surveys, observation, questionnaires, and qualitative feedback from teachers, students, parents, staff and members of the community.
4. **Student Learning:** this refers to data resulting from various assessments and practices used to measure student achievement, attainment, and progress. This includes classroom assessment data, national assessments, external high-stakes tests, state level assessments, and international standardized assessments.

Assessment data is crucial for improving teaching and learning, but its value lies in its use for decision-making and continuous improvement. Schools face challenges in processing and utilizing vast amounts of data from assessments. A systemic approach to using assessment data for school improvement is essential, incorporating clear policies, coherent alignment among various educational components, and a focus on evidence-based evaluation (Claire, Marian, Deborah & Stenius, 2014). Effective data management systems, either developed internally or commercially, ensure standard data collection, accessibility, quality, and reliability of results, aiding in identifying and disseminating best practices (Breiter and Light, 2006).

The following key points, which have been identified by Breiter and Light (2006), are intended for data system decision makers to think about when building their data information and management systems:

1. Consider what goes on in the classroom and the decisions made by teachers on daily bases.
2. Become fully aware of the type of data that is needed for purposes of improvement. For example, when making instructional decisions, educators may need information beyond their students' academic data. They may need information also on their student's personal development, intellectual and physical abilities, and interpersonal and social skills.
3. Understand the logistics of the system, such as the time required from staff to use and manage the system, professional preparation to use the system, and ease of information retrieval.

## ***The Role of Assessment in Driving Continuous School Improvement***

First and foremost, schools need to ensure that the process of improvement is manageable with specific steps that allow educators to build confidence and skills to use data. For this purpose, Boudett, City and Murnane (2020) proposed a model they called the “*Data Wise Improvement Process*” that guides schools in working to improve teaching and learning through evidence-based analysis. This model is composed of eight distinct activities that fall within three categories:

1. **Prepare:** Schools plan the structure around data analysis, exploring data from standardized assessments, develop data teams and ensure assessment literacy.
2. **Inquire:** School teams work to gain knowledge on how to enhance and increase student learning, how to create data overview and graphic displays, identify patterns in standardized testing results, dig into other data sources beyond standardized assessments (triangulation of data), and identify learner-centered problems.
3. **Act:** School teams plan what to do to improve instruction, assess impact of changes and how to assess the impact, and understand the key elements of an effective action plan.

### **ADVANTAGES OF ASSESSMENT IN SCHOOL IMPROVEMENT**

While there are no contentious issues surrounding the need to use assessments to drive the school improvement process, educators’ ability to articulate a common understanding of the many advantages of this link between assessment and school improvement is crucial in building awareness and promoting a data-driven culture. There are several advantages that clearly show the value of assessment in contributing to effective continuous school improvement, propelling schools to action and catapulting them to higher levels of robustness and rigor in meeting student outcomes. The advantages are reflected in several areas that include curriculum enhancement, pedagogical improvements, diagnosing and monitoring student progress, professional development planning, and improved accountability.

#### 1. Curriculum Enhancement

Assessments help schools identify gaps in the curriculum and guide updating and modification of content accordingly. This ensures that students receive comprehensive constructive feedback about their learning.

#### 2. Pedagogical Improvements

Through assessment data, schools will be able to discern and highlight effective and ineffective teaching strategies, and teachers will be able to determine their own instructional effectiveness. Schools can use assessment data and information to refine teaching methodologies and update instructional materials. Popham (2014, p.14) noted that the results of assessments “constitute a particularly compelling indication of whether teachers should retain, alter, or jettison their current instructional procedures.”

#### 3. Diagnosis and Monitoring of Student Progress

Assessments serve as a diagnosis of student progress and assist in determining students’ strengths and weaknesses. Consequently, this helps teachers construct intervention plans to support their students,

## ***The Role of Assessment in Driving Continuous School Improvement***

modify their own practice, identify student skills that have been mastered and those that need further development, and develop plans for curricular modification where needed. The diagnostic nature of assessments also serves as an opportunity for students to understand their own progress, conduct their own self-assessment and build their own improvement goals.

### **4. Professional Development**

Assessment data represents a pivotal source of information that helps schools and teachers identify areas of required professional improvement. Results inform the design of teacher training programs and support the development of specific areas of improvement that can be targeted in professional development initiatives.

### **5. Accountability**

This is another major advantage for schools and communities in which assessment data can be used to demonstrate accountability to students and the community. The need to ensure accountability will also help schools remain focused on maintaining quality standards, monitoring student performance and making the necessary adjustment.

## **TYPES OF ASSESSMENTS USED IN SCHOOLS**

### **Diagnostic Assessment**

Csapó and Molnár (2019) argue that what the learner already knows represents one of the most influencing factors in student learning. Diagnostic assessments reflect that argument as they are designed to assess students' preparedness for a learning task and to identify prerequisite knowledge, possible difficulties, and solutions. Thus, diagnostic tools are useful in assisting educators in the design and development of individualized instruction and intervention for students.

By understanding what students already know and highlighting expected pre-knowledge, teachers can adapt their lesson plans and devise intervention accordingly. Examples of diagnostic assessments include journal entries, classroom discussions, short quizzes, student interviews and reflections, and graphic organizers such as mind mapping and flow charts. In addition to these common diagnostics, there are numerous digital tools in the market (i.e., Informal Reading Inventory, Signs for Sounds, Mathematics Assessment Supplements, Functional Assessment Interview, ABC Checklist) to help educators conduct academic and behavioral diagnostics (*Diagnostic Assessment Tools: Implementation Tools*| NCH, n.d.-c).

### **Formative Assessment**

Formative assessments, distinct from diagnostics, are used during learning to improve teaching and student performance, allowing for pedagogical adjustments (Popham, 2014). They aid in developing self-regulation in students and guide teachers in intervention planning. Stiggins and DuFour (2009) and OECD/CERI (2008) recognize formative assessment's role in enhancing achievement and lifelong learning skills. Its positive impact on performance and motivation is supported by studies (Kingston &

Nash, 2011; Broadbent, Panadero, & Boud, 2018; Ismail, Rahul, Patra, & Rezvani, 2022; Alahmadi, Alrahaili, Alshraideh, 2019). Feedback, a key component, informs instructional changes and student learning goals (Graham, Hebert, Harris, 2015; Fuchs and Fuchs, 1986). Ainsworth (2007) identified several advantages to formative assessments, which include:

1. Allows for regular and timely feedback on student progress and attainment.
2. Provides teachers an opportunity to adjust plans to meet the needs of all students.
3. Provides students an opportunity to demonstrate their understanding using multiple measures of assessments.
4. Enhances collaborative professional opportunities among teachers and departments.
5. Fosters a common understanding of priorities, expectations, and standards.
6. Promotes alignment of various assessments to prepare students for success.
7. Enables educators to diagnose learners' needs.
8. Helps identify powerful practices that enhance student learning.

Despite some research evidence that documents the positive impact of formative assessments and the previously noted advantages, some studies produced mixed and disappointing results, perhaps due to ineffective implementation of the formative assessment and the difficulty that some teachers faced in applying this type of assessment in their classrooms (Schildkamp, van der Kleij, Heitink, Kippers, & Veldkamp, 2020). Thus, improving implementation of formative assessments and equipping teachers with the knowledge and skills for effective implementation is necessary so that schools can harness the power of formative assessments. Popham (2011) argued that reviews of more than 4,000 research studies clearly demonstrated the positive impact of formative assessment, if implemented effectively, on student learning and achievement. Furthermore, the quality of feedback through formative assessment that is needed to make a positive impact is as critical as the feedback itself. Wiggins (2012) identified seven key elements to effective teacher feedback. He suggested that teachers' feedback should be goal-referenced, tangible/transparent, actionable, user-friendly, timely, ongoing, and consistent.

## **Summative Assessment**

While formative assessments are concerned more with improving how to teach and learn, summative assessments are designed to assess the degree of student learning, and assigning a value to how much a student has learned. Summative assessments are *assessments of learning* and are typically high-stakes assessments. They are utilized to measure achievement of learning outcomes, as determined by predefined benchmarks and standards, at a specific juncture during students' engagement in school, such as the end of instructional unit(s) or a course of study, at midyear or at the end of the year (Abdallah & Alkaabi, 2023). Summative assessment results are also utilized formatively to guide pedagogical and programmatic decisions (OECD/CERI, 2008). For purposes of continuous improvement, this assessment data is critical to assist schools in identifying performance trends and patterns, areas of strengths and weaknesses, achievement and progress gaps by various student demographics to develop school improvement plans and short- and long-term improvement goals along with clearly detailed strategies that are grounded in best practice and closely aligned with their improvement needs (Abdallah & Alkaabi, 2023).

Through summative assessments, educators gather test-based data to evaluate student's acquisition of knowledge, skills and competencies based on already completed instructional activities (Popham,

## ***The Role of Assessment in Driving Continuous School Improvement***

2014). They are also used to evaluate the effectiveness of educational programs and progress toward improvement goals, as well as in making decisions for purposes of course placements and student grade promotion and graduation. The results are recorded as numerical scores or letter grades. For example, in a summative assessment, the teacher assesses students' learning by administering mid-term and final exams and giving a letter or numerical grade on the test.

In addition to their function as tools that assess student achievement of established learning outcomes and playing a primary role in monitoring student progress, the reporting to stakeholders on the overall progress of the school and students serves as a measure of accountability. Thus, special consideration must be given to the uses to be made of the data by schools when they decide on how to collect evidence through summative results (Dolin, Black, Harlen & Tiberghien, 2018).

Bhat and Bhat (2019) identified several advantages to summative assessments based on a survey of educational research. These assessments:

1. Provide opportunity to understand and document student understanding.
2. Determine degree of students' achievement, learning progress, growth, and attainment.
3. Record results of summative assessments as a clearly defined parameter in the grading.
4. Serve as a motivator in offering students an incentive and an opportunity to make progress.
5. Boost students' sense of confidence if applied in a positive manner.
6. Provide teachers with an insight into weak areas where improvement is required.
7. Help assess the efficacy and success of utilized strategies and professional development.
8. Guide in the development of instructional design and intervention.

### **External vs. Internal Assessments**

Internal assessment is the process in which teachers and schools judge students' performance based on internally implemented measures of assessments. Grading and evaluating based on the results of these assessments is carried out without involvement of external testing parties. Internal assessments, which can be either formative or summative, involve assessment of students through coursework, essays, projects, tests, assignments, and other learning outcome-related activities. Internal assessments are usually ongoing assessments administered during the academic year. They are frequently more diverse and flexible in criteria, standards and administration methodology than external assessments. In constructing internal assessments, educators should carefully consider the appropriateness of content, clarity in language, and suitability of test questions and skills to what students are asked to respond to or perform (Robby & Gitsaki, 2018).

External assessments are usually prepared by external parties, and more frequently administered by external parties in specific testing centers in which students take the assessment under the same conditions. External assessments administered against international benchmarks are used to compare the attainment of students to other international students. As schools choose certain external assessments, they should plan on ensuring that the selected assessments align well with their formative assessments. Authority (2014) proposed that planning for this alignment should ensure that external assessments demonstrate authentic and real-world tasks and skills; clear explanations of tasks and skills to be assessed; clear criteria for success; and transparency on the quality of the assessment and what the reported results mean according to the established grading scale.



While educational institutions utilize external assessments for various reasons, one of their key functions is to guide in the assessment and improvement of the educational system. Schools use external assessments frequently to corroborate internal assessments, align to best practices, measure students' performance on internationally recognized standards, demonstrate accountability in meeting national requirements, and for purposes of students' college admissions. External assessments are also used to provide teachers and educational leaders with feedback and comparative evaluations with international benchmarks; assess knowledge and skills acquisition by students; diagnose the educational system conditions; and provide objective information to stakeholders (Reym, 2010).

## **Transforming Assessment Data Into Actionable Knowledge**

Collecting masses of data and gaining knowledge from it is not enough to maximize school performance. The continuous school improvement process cannot evolve without employing the gained knowledge through data to propel action. Effective schools turn data into actionable knowledge that impacts their decision making and outcomes. They analyze data to have a better understanding of their current condition and to plan, examine their current practices to meet their outcomes, and identify and predict trends, patterns and relationships to ensure success and pre-empt failure.

Based on a review of literature, Breiter and Light (2006) identified six broad steps that schools go through sequentially from the initial phase of having data that has been collected, then transformed into information, and finally to knowledge that propels decision making. While these steps are logical, the nature of school improvement as a continuous process requires that the data process become a continuous process as well. The authors constructed the CASA model, as shown in Figure 1 to demonstrates the cycle of transforming data into actionable knowledge (See Figure 1)

Schools that follow the CASA model will be able to effectively draw meaning from the multiple data sources and translate this into specific actions after the data has been *collected, analyzed, synthesized*, and then transformed into *action*. The *action* phase begins with schools transforming information gained through data analysis and synthesis into actionable knowledge, that is by establishing actionable targets and goals (Abdallah et al,2023). The cycle does not stop with the *action* phase but continues as the actions should be evaluated after a designated period of implementation, thus resulting in further collection of data and a repeat of the cyclical phases. It is important to note that being at the *action* phase can serve both immediate and long term planned actions. For example, teachers would need to act expeditiously right after gathering and analyzing sufficient and reliable formative feedback that required a change to an instructional strategy that has been proven ineffective. In other cases, as in working toward system-wide curricular and instructional modifications, a well-developed action plan is required. The school improvement plan (SIP) serves as the appropriate form to include actionable targets and goals.

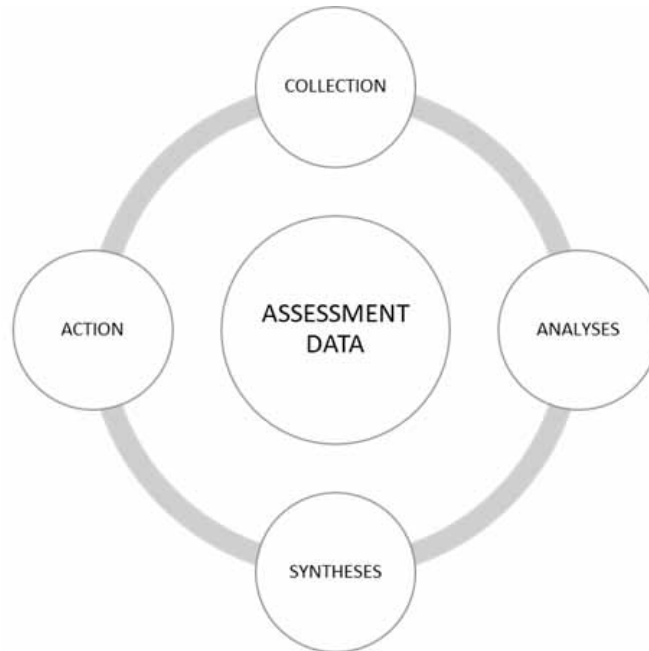
Bumblauskas, Nold, Bumblauskas and Igou (2017) argued that there are several essential elements required for the transformation of data to actionable knowledge. They include:

- Availability of valid and current information.
- Ability to make informed choices.
- Vigilance in monitoring the validity of input information and decision execution.
- Ability to reevaluate data based on new knowledge and perspectives.

## The Role of Assessment in Driving Continuous School Improvement

Figure 1. The CASA Model

Note. The CASA model, developed by Suleiman Hamdan and Gihan Fradi in 2023, represents the essential four primary processes that must be part of the continuous data cycle to ensure a data-driven school improvement process.



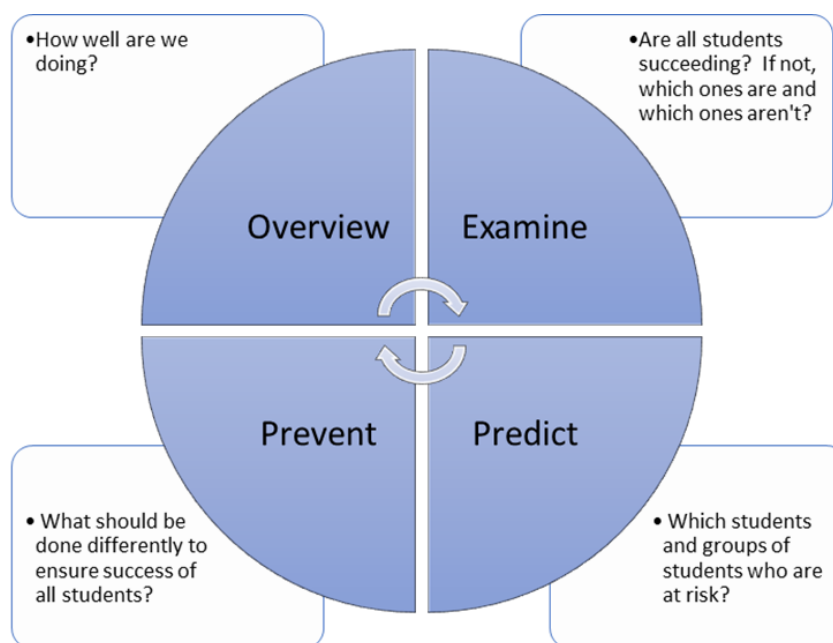
- Prevailing culture of trust that maximizes performance and improves communication.
- Unity of vision and common understanding of the actions to be pursued based on data.

Turning data into actionable knowledge requires data teams to engage with data in a process that assesses how well the school is doing; whether students are succeeding; identifying those at risk of failure; and exploring what can be done differently. Bernhardt (2000) suggested that the goal of this process is to “discover and uncover” the kind of information that helps us understand the meaning of this data, and how to use it to impact outcome through appropriate actions. Figure 2. details the process proposed by Bernhardt (2000).

The illustration in Figure 2 provides a logical approach for school improvement teams to follow in the process of turning data into actionable knowledge. In the first critical step after the collection of data, they need to analyze data and assess how well the school is performing based on current and trend data in relation to student achievement, progress and attainment (Darawsheh et al,2023). Then, the generated data should be examined carefully according to multiple variables such as student achievement by gender, nationality, students of special needs, and other demographics.

The task of improvement requires schools to ascertain whether all students are learning, and to identify those individuals and groups of students that underperformed vis-a-vis established curriculum standards and outcomes. Once this step has been completed, school improvement teams should dissect the data to identify trends and patterns to assist in the prediction of performance and students at risk, and consequently aid in the development of intervention and adjustment of curriculum and instruction. Finally, exploring patterns of performance should consider, in addition to student performance data, the

*Figure 2. Data analysis process*



perceptual data gathered through student surveys and interviews. Student feedback provides an additional valuable perspective that will help compliment student performance data to assist teachers planning for higher levels of student success and to prevent failure.

## **CHALLENGES AND CONSIDERATIONS IN SCHOOL ASSESSMENT**

School assessment challenges include inadequate investment in modern technologies, leading to reliance on outdated data collection and analysis methods. This hampers improvement in test quality and accessibility. Addressing this involves investing in simulation technologies and data management tools. Traditional methods are time-consuming and flawed, affecting school improvement effectiveness. Additionally, there's a need for assessment-focused professional development and basic assessment literacy for all teachers. Time constraints and daily responsibilities challenge teacher involvement in the assessment process, necessitating administrative changes, such as reconfiguring teaching loads and offering incentives. Attention to assessment validity, reliability, and alignment with learning outcomes is crucial. Assessments should be free from cultural biases and accommodate students with special needs or limited English proficiency, ensuring testing equity.

## **SCHOOL IMPROVEMENT THROUGH ASSESSMENT**

For this study, the authors randomly selected 6 out of 54 schools in the Emirate of Sharjah, UAE, that achieved a quality level of “good” or higher on their 2022-2023 School Performance Review. The authors reviewed each of the six school’s final 2022-2023 School Performance Review report and provided each

## ***The Role of Assessment in Driving Continuous School Improvement***

school a questionnaire and conducted an interview with the school's designated improvement advisor to gain further insight into the school's assessment processes.

Five of the selected six schools completed and returned the questionnaire for the purposes of this study. One of the five responding schools did not provide sufficient and detailed information that is useful for this research, and thus was eliminated from this study along with the school that did not complete the questionnaire. This left the authors with four remaining schools for inclusion in this research. The schools are Al Marifa International School, Al Noor International School, GEMS Millennium and Taryam American Private School. The findings contained under each of the case studies discussed in this section are derived from the schools' 2022-2023 School Performance Review final report, the "Assessment in School Improvement Questionnaire" and personal interviews with the school improvement advisors assigned to each school by the educational regulator, the Sharjah Private Education Authority (SPEA).

## **BACKGROUND**

The School Performance Reviews in 2022-2023 were conducted by the Sharjah Private Education Authority (SPEA), which is the official governmental education regulator of private schools in the Emirate of Sharjah, UAE. The same four schools in this study had gone through a similar performance review during the academic year 2018-2019. Both school reviews in 2018-2019 and 2022-2023 were conducted in accordance with the same school evaluation framework, the United Arab Emirates School Inspection Framework 2015-2016. Schools that underwent the review were assigned a quality level at the conclusion of the performance review, in which school evaluators used a six-level scale in making judgements about the reviewed school: *Outstanding, Very Good, Good, Acceptable, Weak and Very Weak*.

Two simultaneous activities were pursued by the authors for the purposes of these case studies to understand and highlight the schools' assessment systems and processes that contributed to their improved quality rating. First, the authors reviewed each of the school's Performance Review report issued by the Sharjah Private Education Authority (Sharjah Private Education Authority (SPEA), 2022) and extracted relevant information that detailed specific references to implemented assessment practices; and second, they sought further evidence of such practices through a questionnaire they sent to each of the selected school's principals in September 2023, in addition to interviews with SPEA's school improvement advisors. The questionnaire and the interviews contained the following 5 open-ended questions:

1. How do teachers make effective use of data in planning their lessons and instruction?
2. How has the use of data improved outcomes for students?
3. How do you ensure that teachers use data effectively to influence teaching, curriculum and students' progress?
4. How do you manage the process of data gathering, analysis and reporting?
5. How is data used to drive the continuous school improvement process?

## **CASE STUDIES**

The case studies in this section detail the key elements of effective assessment practices that contributed to the improved quality ratings of the four schools. The information contained under each of the following

case studies represent a compilation of such information gathered from the final report of the 2022-2023 School Performance Review (Sharjah Private Education Authority (SPEA), 2022), the results of the questionnaire and interviews with the schools' designated improvement advisors:

### **Al Marifa International Private School**

Al Marifa, a private school with American and British curricula and 3378 students, improved its quality rating from Acceptable in 2018-2019 to Good in 2022-2023. Teachers use varied internal assessments aligned with curriculum standards, analyzed by data analysts and department heads to inform teaching and curriculum adaptation. External exam data benchmarks performance internationally. The school emphasizes data literacy, with a data platform for all teachers, regular data meetings, and professional development in data analysis.

### **Al Noor International School**

Al Noor International School, with 2881 students, improved from Acceptable in 2018-2019 to Good in 2022-2023. Teachers use data-driven lesson planning, diagnostic tests, and group categorization based on proficiency and learning styles. Their approach enhances targeted instruction, personalization, and curriculum refinement. Regular progress assessments and stakeholder communication are pivotal. The school participates in TIMSS and PISA and conducts annual exams for grades 3-9 in core subjects.

### **Taryam American Private School**

Taryam, a K-12 American curriculum school with 917 students, improved from Acceptable in 2018-2019 to Good in 2022-2023. Teachers utilize internal assessments aligned with curriculum standards, supported by an assessment coordinator and department heads. Data informs lesson planning and curricular modifications, with weekly adjustments and term-based planning. Benchmarking involves NWEA's MAP and EmSAT assessments. A data management system assists in monitoring and planning for student progress, under policies overseen by the assessment coordinator for data validity and result reliability.

### **Gems Millennium School**

GEMS Millennium, an Indian Curriculum K-12 school with 2238 students, improved from Good in 2018-2019 to Outstanding in 2022-2023. Teachers use data from sources like CAT4 and PASS for tailored lessons, leading to enhanced student outcomes. Regular feedback, data analysis, and comprehensive knowledge of assessment among leaders contribute to school improvement, including teaching practices, leadership development, and parent engagement. The school's systematic approach to self-evaluation and planning has driven significant progress over time.

## **RECOMMENDATIONS FOR SCHOOL ASSESSMENT PRACTICES**

School assessment, serving as an anchor for continuous school improvement and a vehicle to assess and improve student learning outcomes, should be developed and selected carefully to ensure meeting the

## ***The Role of Assessment in Driving Continuous School Improvement***

needs of all students in a vastly changing world that requires schools to adopt a different mindset and greater innovation in testing modalities, protocols, formats and accommodations. Not only a new mindset is required, but also new structures that provide investment in teacher preparation and encouragement of professional collaboration.

### **Assessment Innovation**

Innovation in assessment, driven by political and public demands for accountability, focuses on supporting students and teachers. Olson (2020) highlights interest in assessment designs that provide quick feedback and incorporate varied, regular assessments, including online and performance-based tasks. O’Keefe and Lewis (2019) emphasize the relevance of instructional resources and interim assessments for timely, reliable student progress information. These interim assessments aid in early identification of at-risk students, allowing timely interventions and feedback, and are complemented by formative assessments to enhance teacher-student communication and feedback quality. Multiple formats in assessments offer teachers flexibility in tool selection. Herman (2017) notes the importance of these assessments in instructional and curriculum planning.

### **Professional Collaboration and Development**

Innovative assessment requires investment in professional collaboration and development for teachers to effectively manage assessments, deduce actionable knowledge, and make data-driven decisions. Successful models like the Michigan Assessment Consortium demonstrate the value of training in formative assessment. Schools should foster teacher collaboration in assessment processes, extending their roles beyond test administration to include developing assessments, managing student evaluations, and addressing achievement gaps (O’Keefe & Lewis, 2019; Hamdan & Fradi, 2023).

### **Support Resources**

Just as with professional development, school’s investment in supportive tools to improve implementation of assessment is pivotal to increased quality (Jandigulov et al,2023). For example, teachers in the United States who participate in the Smart Balanced assessment are provided various tools that provide differentiated lessons and activities that can help teachers support student learning and enhance instruction; embedded formative assessment strategies and connections to interim assessment items; and links to additional resources for educators (Our System - SmarterBalanced, 2022). Support resources for students should also be made available to ensure improved testing equity for all students and reduce testing barriers that adversely impact assessment results.

## **CONCLUSION**

Assessment, integral to school improvement, focuses on student learning and accountability, guiding schools towards quality education and achieving outcomes. It enhances curriculum, teaching methods, and instructor training, ensuring reliable information for improvement. The case studies from Sharjah’s schools exemplify the impact of a systemic approach to assessment led by committed leadership. Suc-

cess in assessment requires goal-oriented, data-driven leadership and educators skilled in data analysis, fostering change and collaboration towards common goals. Effective assessments address all student needs, demanding innovative tools and measures for valid, reliable data.

## **ACKNOWLEDGMENT**

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# Chapter 19

## 3D Feedback: A Three-Dimensional Feedback Approach That Makes Students Feel, Think, and Act Big

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### ABSTRACT

*Feedback is a vital component of formative assessment processes. Criteria for providing effective feedback practices have been reinforced in governments' recent educational documents. The development of engaging feedback approaches that foster students' progress and maximize their motivation has gained increased popularity in both research and practice. This chapter aims to present a three-dimensional approach to providing feedback (3D feedback) that supports student engagement with feedback comprehensively—emotionally, cognitively, and behaviorally. Within this frame, an inclusive account of key indicators/activities reflecting the three dimensions of engagement with feedback is provided, along with their pedagogical implications. This is potentially useful to educators who are interested in adopting feedback interactions that are meaningful and stimulating to students, with clear purposes. The chapter also proposes guidelines for high-quality, engaging, and formative feedback, drawing on best practice principles and research findings.*

### INTRODUCTION

Learning is not a straightforward process because knowledge and understanding are constructed and reconstructed in a continual and progressive manner while being shaped through learning experiences (e.g., meaning-making, dialogue, and learning by doing), both within and between individuals (Dun-

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### **3D Feedback**

worth & Sanchez, 2016). A common practice that acts as a catalyst to drive this process of knowledge construction and reconstruction is ongoing formative assessment, also known as assessment for learning. It is the condition through which teachers elicit, analyze, and respond to the formative data they had obtained about their students' understanding (Strijbos et al., 2021) to identify the specific learning misconceptions, gaps, or struggles that need to be addressed while deciding on the next learning path for the students (Carless, 2019). Such responsive interventions are undertaken through diverse activities and strategies that often take place at the beginning, middle, or end of a lesson (Elsayed & Cakir, 2023).

The step that stands out as the most significant in the formative assessment process explained above is the teacher's response to the diagnostic data at hand by giving a quick and valuable piece of information—feedback—to acknowledge and enable the progress in the student's current performance (Price et al., 2010). In this regard, the prevalent general understanding found in the relevant educational literature represents feedback as “information provided by the teachers to the learners regarding some aspect(s) of their work or performance, to modify the learner's cognition, motivation and/or behavior for improvement” (Duijnhouwer et al., 2010, p. 16). Taking a broader view, all modes of communicative dialogues that support learning (Carless, 2022), both formal and informal, such as oral, visual, or text-based, are considered feedback (Sadler, 2010). For instance, facial expressions, body gestures, grades, advice, praise, or criticism are all types of post-response information and are considered feedback once they involve an element of assessment or evaluation (Wiggins, 2012). Generally, as an instructional tool, feedback intends to serve the following functions: confirm correct answers, address mistakes and weaknesses (criticism or critical feedback), rectify errors (corrective feedback), explain errors, demonstrate correct practices (e.g., ideal or model answer), engage students in critical thinking, challenge students' preconceptions, suggest further search, appreciate the strengths in students' work by giving them praise and encouragement (positive feedback), justify marks, and suggest approaches for future assignments (Alt et al., 2023; Sanford, 2018).

Irrespective of the function that the feedback strives to serve, the embedded information is considered formative when it highlights three major areas of students' learning (Hattie & Timperley, 2007):

1. ‘How are they doing?’ This provides students with information that can help them recognize the gap in their learning.
2. ‘Where should they aim at?’ This identifies specific goals of learning.
3. ‘What should they do next?’ This determines the action needed for closing the gap to help learners improve.

Ultimately, the impact of the communicated feedback information on the learner's improvement, whether in the short term or the long term, should become the end goal (Sadler, 2010). This shifts the attention from the input process, in terms of how the feedback is constructed, to the output that mainly involves the student's interaction with that information (Elsayed & Cakir, 2023). As such, equal importance is placed on the feedback provider (the teacher) and the feedback receiver (the student). Thereby, students are expected to fulfill their role in the feedback practice by seriously considering investing their time and effort in the uptake of the information from the received feedback to upgrade their learning (Ali et al., 2015; Carless, 2019; Nash & Winstone, 2017; Scott et al., 2011). In this sense, feedback without the students' active engagement is completely unproductive (Carless, 2019). Thus, the students' agency in the regulation of their own learning is crucial in making feedback effective for learning (Strijbos et al., 2021) and is the essence of sustainable feedback (Carless, 2022).

Nevertheless, it should not be taken for granted that all students need to engage in time and effort-consuming actions to enable their uptake of the feedback (Winstone et al., 2019). It is both notable and disappointing that in recent literature, student engagement with teacher feedback has been frequently judged as limited, passive, and challenging (Ajjawi et al., 2022; Van der Kleij, 2020; Winstone et al., 2021). This means that they do not always consciously internalize and work on feedback, and some might just skim the comments or even fully disregard the feedback (Zhang & Zheng, 2018). A fairly straightforward explanation for this dilemma is simply that some students do not think of feedback as something profitable and essential for their improvement (Winstone et al., 2016). In support of this, Sadler (2010) notes that some students are more or less inclined than others to turn feedback information into their advantage. Displaying a responsible stance toward the feedback or not doing so, is at the end, a decision made by students (Winstone et al., 2017) and needs to be voluntarily performed by the students themselves, rather than coerced (Price et al., 2011).

By implication, students' disengagement from feedback becomes a source of frustration for educators who spend a lot of time on grading the students' work and provide them with high-quality feedback (Carless, 2022; Vattøy et al., 2020). As such, students' disengagement from feedback becomes a prime concern internationally across different learning stages and academic subjects (Ali et al., 2015; Carless & Boud, 2018; Winstone et al., 2021). Accordingly, the question of how to engage students with feedback is emphasized and often surfaces when discussing the usefulness of feedback in classrooms; thus, it has gained increasing attention in recent educational literature (Esterhazy & Damşa, 2019). The more the feedback is utilized thoughtfully in alignment with the best practices of formative assessment, the better the outcomes.

## Purpose and Chapter Outline

This chapter is intended to provide a more profound understanding of how engagement with feedback operates in a broad sense, while considering the three interdependent dimensions of engagement—emotional, cognitive, and behavioral—that are based on Fredricks and colleagues' (2004) holistic framework for student engagement. Within this framework, this chapter explains how a multidirectional approach to feedback, which is called 3D feedback here, helps engage students at these three levels. In doing so, this chapter unfolds previous research studies on students' engagement with feedback (e.g., Ali et al., 2018; Carless & Boud, 2018; Han & Xu, 2021; Man et al., 2021; Zhang & Zheng, 2018; Zhan et al., 2023) to display the characteristics of 3D feedback in a practical sense by establishing a preliminary categorization of its key activities/indicators. This step is necessary, given that the application of these multidimensional facets of feedback may be lacking in many classrooms, which can be perceived as a key weakness undermining the students' active engagement with feedback.

Incorporating the 3D approach with the recommendations for engagement with feedback that are proposed in this chapter presents some practical advantages. It is potentially useful to educators who are interested in maximizing their feedback literacy and honing their skills in order to adopt new ways of feedback interactions that foster productive student engagement (Zhan et al., 2023). Many educators may not have received substantial training in how to make the right choice of words and present the feedback in a tactful and constructive manner, whether written or spoken, the very best it can be, to remain influential in their students' learning. Without this attention, teachers will not become confident in implementing the formative features of assessment in their classrooms (Han & Xu, 2021; Molloy et al., 2020).

### **3D Feedback**

Overall, the current work highlights some features of interest for the wider community of teachers and other practitioners. It has the currency for adoption across different subjects and grade levels since the discussed 3D approach for engagement with feedback serves shared purposes, enabling educators to apply them to their unique contexts, so their feedback can be utilized in more engaging and inspiring means.

Against this introduction, the next section is devoted to connecting the research problem to extant literature. First, the chapter provides a background on the multidimensional approach that considers student engagement with feedback at the emotional, cognitive, and behavioral levels, building on Fredricks and colleagues' (2004) framework for student engagement. The, it presents an inclusive account of key indicators/activities reflecting the three dimensions of engagement with feedback—emotional, cognitive, and behavioral—involving the “what, when, how, and why” of each context. Special attention is paid to how to translate these findings into pedagogy by offering teachers the corresponding strategies that encourage students to successfully utilize the teachers' feedback at the aforementioned levels. This chapter concludes with suggestions for further research in the local context and beyond.

## **A MULTIDIMENSIONAL APPROACH TO STUDENT ENGAGEMENT**

Generally, students' active engagement in learning is a key contributor to academic achievement as it is linked to higher levels of academic commitment, grades, discipline, and school completion rates (Fredricks et al., 2016). Fundamentally and in a general sense, student engagement reflects the level and quality of student involvement that is directed toward achieving high learning outcomes (Fredricks et al., 2004; Hu & Kuh, 2002). However, it is worth noting that such involvement is not only limited to observable actions or apparent behaviors (Handley et al., 2011) but also entails invisible activities, such as those related to feelings, attitudes, and sense-making processes (Carless et al., 2011). Thereby, significant contributors to the field have done much to shape the understanding of the complexity associated with engagement as a construct.

Overall, there is a broad consensus that the concept of engagement needs to be viewed as a multifaceted entity, or rather, as a ‘meta-construct’, involving multiple components that are evidenced in a range of activities or indicators (Fredricks et al., 2004). Specifically, prior research has identified three widely accepted dimensions of engagement, namely affective/emotional, cognitive, and behavioral, which have been deemed interdependent (e.g., Fredricks et al., 2004; Han & Xu, 2021; Yu et al., 2019). Two additional dimensions have been highlighted in the literature; one is agentic engagement (Reeve & Tseng, 2011), denoting the proactive contribution to the learning activity, such as when the student enriches the task and advances the suggested way of approaching it. The other dimension is social engagement (Fredricks et al., 2016), which is concerned with collaborative engagement, such as those conducted as part of group work. Students may engage either positively or negatively in any of these dimensions of engagement, in varying degrees and at different times (Fredricks et al., 2004). For example, in a group project, a student may contribute to raising the standards of the assigned task while devoting extra effort to enhancing its quality, whereas another student may decide to put the least amount of effort in performing the task, being dependent on other members of the group (negative social engagement).

Translating this understanding to the current focus—students' engagement with feedback—this means that they are expected to engage with the teacher's feedback at multiple levels, basically the affective, cognitive, and behavioral, all of which intersect in reality. In advocating this approach, Price and colleagues' (2011) three-year study that focused on student engagement with assessment feedback drew

attention to the need for a more socially embedded and holistic paradigm of engagement with feedback. Furthermore, recent conceptualizations of feedback started to explore the nature of students' active engagement with feedback through the multidimensional lens. For instance, Jørgensen (2019) and Yu et al. (2019) recommended students' affective, cognitive, and behavioral involvement in the teachers' comments on their submitted work.

Given the above, the central question to be answered next is how can educators engage students with teachers' feedback on these multifaceted levels? In other words, how can students feel, think of, and act on the information they received? In the quest to address this inquiry, the current chapter considers the three dimensions of student engagement (Fredricks et al., 2004) in the discussion of the multidimensional approach of engagement with feedback. These dimensions are dynamically interrelated (Christenson et al., 2012) and thus, should not be overlooked or taken as an isolated process if the aim is to examine the phenomenon of engagement in a comprehensive manner (Fredricks et al., 2016). This approach's advantage also lies in its fluidity and flexibility. It could be adapted to different learning domains or contexts (e.g., engagement with a particular teaching in a certain academic subject or at a specific class level), while catering to the engagement of different demographics of students (e.g., college students or school-level students) (Fredricks et al., 2016).

## **FEELING, THINKING, AND ACTING ON THE FEEDBACK**

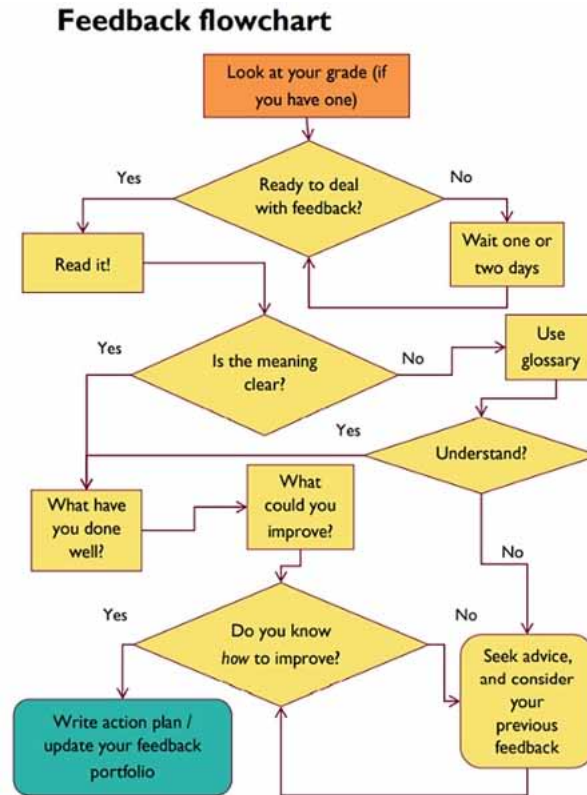
Winstone and Nash (2016) provided a productive practical transformation of the theoretical ideas relating to engagement with feedback across different dimensions of engagement for classroom teaching and learning purposes. In their contribution, they designed an educational toolkit called Developing Engagement with Feedback Toolkit (DEFT), which contains open-access editable materials that can be utilized to support engagement with feedback (e.g., feedback glossary with the meanings of commonly used feedback terms, workshop materials, student feedback guide, and feedback portfolio). The toolkit encapsulates the three dimensions of engagement with feedback, starting with the emotional readiness to deal with feedback, the recognition of feedback, the synthesis of its content, and ending with deciding what actions to do next for improvement (see Figure 1).

### **Feelings About Feedback: Affective/Emotional Engagement**

Learning is indeed an emotional process, and the teaching profession, in its entirety, cannot be detached from emotions (Christenson et al., 2012). The rationale behind this notion is that feelings are key to gaining access to the mind, and people first react emotionally to the information, which then informs their subsequent reactions (Kahneman, 2011). This understanding places a particularly high value on the need to influence the emotional mind first (Kahneman, 2011), which is especially true in the case of feedback because it is an emotional business (Ajjawi et al., 2022). More explicitly, emotions strongly influence how students engage with feedback (Quinton & Smallbone, 2010); they are essential for maintaining students' motivation (Shute, 2008) and reinforcing their willingness to follow the requirements stated in the feedback (Fredricks et al., 2004). Therefore, the most influential act in the process of giving feedback is when teachers need to precisely select the words and communicate these in a way that demonstrates their emotional understanding and support in order to positively affect their students' feelings. For instance, instead of crossing out an answer to indicate that it is wrong, the teachers may

### 3D Feedback

Figure 1. Feedback flowchart  
(extracted from Winstone & Nash, 2016, p. 21)



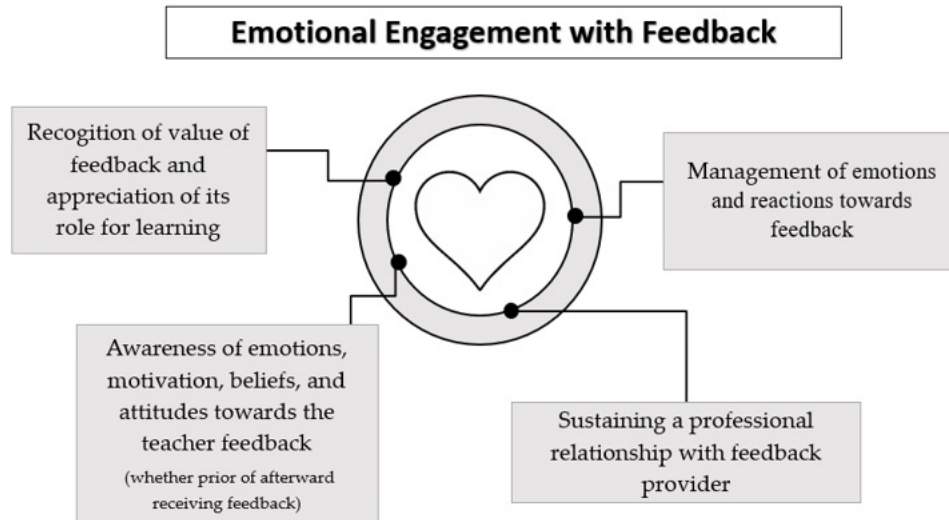
respond by writing, “You decided to ..., which is right in the sense that... but is not scientifically sound in the sense that ..., so how about ...?”

Emotional engagement with feedback is generally expressed through “affective reactions” or general feelings toward teachers, classmates, academics, and the school, whether positive or negative (Christenson et al., 2012). Specifically, it highlights the following key features: recognition of the feedback’s value and role in learning, the students’ feelings toward the feedback, and the ability to positively manage those feelings to avoid potential damaging consequences, whether for themselves or others (e.g., affecting the relationship with the person providing the feedback) (Carless & Boud, 2018; Han & Xu, 2021; Quinton & Smallbone, 2010; Yu et al., 2019). Figure 2 summarizes the key features characterizing emotional engagement with feedback.

More specifically, feelings toward the feedback may involve the students’ emotions (e.g., interest, enjoyment, boredom, happiness, and anxiety), motivation (e.g., a desire to learn or improve their grades), beliefs (e.g., perceiving an error as a sign of weakness), and attitudes (e.g., acceptance or rejection of the feedback) (Carless & Boud, 2018; Quinton & Smallbone, 2010). Such sort of emotional interaction can be an outcome of the feedback and/or a mediator of other outcomes. In other words, it can be considered a pre-factor or a post-factor since the students may have prior affective dispositions before engaging with the given feedback or may experience these emotions after receiving the feedback. Nevertheless, whether emotions have already existed before engagement with the feedback or are evoked as a result



Figure 2. Key features characterizing emotional engagement with feedback



of the obtained feedback, they affect the students' willingness to invest their efforts in learning from the feedback (Han & Xu, 2021). For instance, positive emotional engagement may be demonstrated by the students' appreciation of feedback as a key means of improvement (Cartney, 2010) and their openness to receiving comments on their work without displaying a defensive or aggressive stance, specifically in the case of critical comments or low grades (Cengiz & Ayvaci, 2017).

Because feedback may trigger emotions in some way or another, such as those explained above, students need to have the ability to positively manage their own emotional responses to feedback and most importantly, maintain a positive relationship with the person providing that feedback, that is, the relational dimension (Price et al., 2011). This "management of feelings" has been considered by Dowden et al. (2013) as a vital and natural part of receiving feedback and has been identified as a critical competency to become feedback literate (Carless & Boud, 2018). However, when naturally occurring, it demands a great deal of emotional strength, commonly known as emotional intelligence. In this respect, some students have been able to keep the adverse impact of unwelcomed feedback under control and overcome their negative emotions, such as frustration or embarrassment, to further use the teacher's feedback successfully (Mahfoodh, 2017).

To this end, Table 1 offers examples of responses that showcase how the emotional element can be incorporated into feedback. These phrases are not confined to specific academic subjects or learning levels; they can be adapted for different purposes and thus have a wide applicability across learning contexts.

### Thinking Through Feedback: Cognitive Engagement

Cognitive engagement is required to assimilate complex ideas, accomplish tasks, and master difficult skills (Christenson et al., 2012). It is undertaken through information-processing activities to plan, monitor, and evaluate one's own thinking (Fredricks et al., 2016). These may include all sorts of cognitive and metacognitive learning strategies and processes, such as summarizing, remembering, analyzing, organiz-

### 3D Feedback

Table 1. Examples of responses demonstrating the incorporation of the emotional element in feedback

Feedback Element	Purpose	Feedback Phrase	Advantage
Emotional	To continuously support the emotional fulfillment of students through words of inspiration and empowerment	<i>You always surprise me when you...</i>	Showing interest in students' work
		<i>This is impressive and makes sense to me, as you...</i>	Praising specific positive features of students' work
		<i>That was quite a challenging task. I commend you for taking the challenge, as you...</i>	Maximizing students' self-confidence

ing, and understanding the material studied, besides relating the newly learned information to existing knowledge (Fredricks et al., 2011). Self-regulation to manage learning also comes as part of cognitive engagement, as is the case of regulating one's attention and effort while studying (Fredricks et al., 2016).

Students may cognitively engage with feedback information in similar ways, as explained above, through various mental strategies to regulate their learning while processing feedback (Han & Xu, 2021; Price et al., 2011; Yu et al., 2019). For instance, they may engage in a mindful reflection on their work (Jørgensen, 2019); notice and identify the reasons for their errors and correct them (Cengiz & Ayvaci, 2017; Han & Xu, 2021), as well as make evaluative judgments and sound decisions about the quality of their work and that of others (Carless & Winstone, 2023). Students actually allocate their mental efforts and a great deal of concentration, as part of these processes, to the absorption of their teachers' feedback (Man et al., 2021). Figure 3 sums up the key features characterizing cognitive engagement with feedback.

Table 2 provides a more detailed account of the activities/indicators associated with students' cognitive engagement with feedback, reflecting the key features displayed in Figure 3.

The stage where students engage with feedback at the cognitive level is vital (Price et al., 2011). The reason is that such an act prompts students to meaningfully consider taking up feedback in relation to their learning goals, which, in turn, maximizes their awareness of the learning processes involved in the assignment (Zhang & Zheng, 2018). It encourages them to attempt to fully comprehend the feedback message to further execute what is needed (Winstone et al., 2021). However, when this stage does not occur, students will be unable to detect their errors and explore the misconceptions that led to these errors (Cengiz & Ayvaci, 2017); as a consequence, they might repeat the same mistakes in the future.

Figure 3. Key features characterizing cognitive engagement with feedback

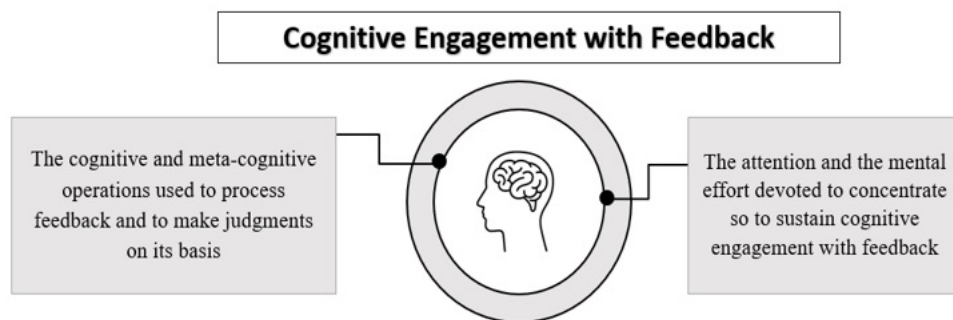


Table 2. Categorization of activities/indicators reflecting cognitive engagement with feedback (Source: Rabbani, in press)

	Activities/Indicators
<b>Cognitive engagement</b>	<ul style="list-style-type: none"> <li>• Look over and read the feedback comments (Ali et al., 2015).</li> <li>• Summarize and organize the information (Fredricks et al., 2011).</li> <li>• Attempt to understand and make sense of the feedback information (Boud &amp; Molloy, 2013; Man et al., 2021).</li> <li>• Notice and identify the reasons for the errors and correct them (Han &amp; Xu, 2021).</li> <li>• Spend time on a mindful reflection on the work based on the feedback (Ali et al., 2015; Jørgensen, 2019).</li> <li>• Make attempts to figure out the reasons for the addressed errors (Man et al., 2021).</li> <li>• Focus on the areas that need improvement (Ali et al., 2015).</li> <li>• Practice problem-solving, self-correcting (Finn et al., 2018).</li> <li>• Relate the newly learned information to existing knowledge (Fredricks et al., 2016).</li> <li>• Avoid any distractions to focus on learning or the task at hand (Fredricks et al., 2011).</li> <li>• Make an evaluative judgment or self-assessment of one's work (Carless &amp; Boud, 2018; Cengiz &amp; Ayyaci, 2017).</li> </ul>

Accordingly, for formative feedback to work in a cognitively engaging way, it should not only target factual knowledge but also have the sole intention of building on, probing, and extending the students' conceptual understanding to scaffold productive thinking (Chin, 2006). Feedback in this sense helps stimulate deeper thinking beyond simple recall, while directing students toward either judging their existing knowledge or producing new knowledge on their own, thus achieving greater conceptual understanding of ideas rather than remaining at the level of surface knowledge (Price et al., 2010).

For instance, cognitively engaging feedback may come in the form of open questions to evoke a dialogic discourse that challenges the students' ideas and allows them to argue, justify, and debate on these, enabling them to make their thinking more visible and scientifically sound (Chin, 2006), which applies to the feedback on both correct and incorrect answers. As explained by Chin (2006), this may include questions of clarification (e.g., Can you give an example? What do you mean by that?); questions that probe assumptions (e.g., Why would you say that? What makes you think that is true? Could be there another interpretation for that?); evidence and reason (e.g., What are your reasons for that? How can you prove that?); consequences and implications (e.g., What might happen if you did this ... not that...? What are the implications of ...? Does this also apply to ...?); and questions about perspectives or viewpoints (e.g., How do these ideas differ from that idea? How does this point relate to ...?).

Such examples of elaborative feedback are beneficial in several ways. They put further pressure on the students to use their own mental resources for practicing deep reflection of the target mistake, self-correction, and repair; they stimulate brainstorming of ideas to make inferences or generate explanations; and they expose students to cognitive challenges (Chin, 2006; Price et al., 2010), all which facilitate long-term retention of the correct information (Finn et al., 2018). Clearly, in these scenarios, the feedback hands over the responsibility of thinking to the students; therefore, it is more student-centered. In illustrating this point, Chin (2006, p. 1341) posits:

*As part of formative assessment instructions, teachers need to initiate lines of discourse that engage students in various cognitive processes such as comparing, generating hypotheses, explaining, predicting, interpreting, inferring, and reflecting. Teachers need to decide what questions to ask, in what sequence, and how to adjust the questions to accommodate student contributions to enable moving forward in their thinking.*

### 3D Feedback

An important consideration here is that teachers need to choose the right questioning approach in their composed feedback to properly address the specific type of error. In clarifying this point, Bennett (2011) explains that the error that the teacher may observe while assessing the student’s work may be attributed to several underlying causes, for example, it could be due to a slip (a careless procedural mistake), a misconception (a naïve view), a misunderstanding (confused knowledge), or a lack of understanding (missing pieces of knowledge). Therefore, the teacher may use corrective or direct feedback, which provides quick fixes and rectifies the incorrect responses in the cases of the slip-related errors and simple questions that merely demand recall of information. In contrast, when students give an incorrect answer that reflects a misconception or misunderstanding, the teacher shall pose a series of further challenging questions as a follow-up to reveal the students’ assumptions. Table 3 offers examples of responses that showcase how the cognitive element can be used in feedback.

Table 3. Examples of responses demonstrating the use of the cognitive element in feedback

Feedback Element	Purpose	Feedback Phrase	Advantage
Cognitive	To prompt a deep cognitive deliberation of students’ ideas	<i>I would like to know on what basis you considered...</i>	Tapping into students’ misunderstanding of a concept
		<i>How about reinforcing your argument here with stronger evidence?</i>	Validation of ideas
		<i>If... is true, why does it not apply to...</i>	Fostering conceptual change by challenging previous perceptions

### Acting on Feedback: Behavioral Engagement

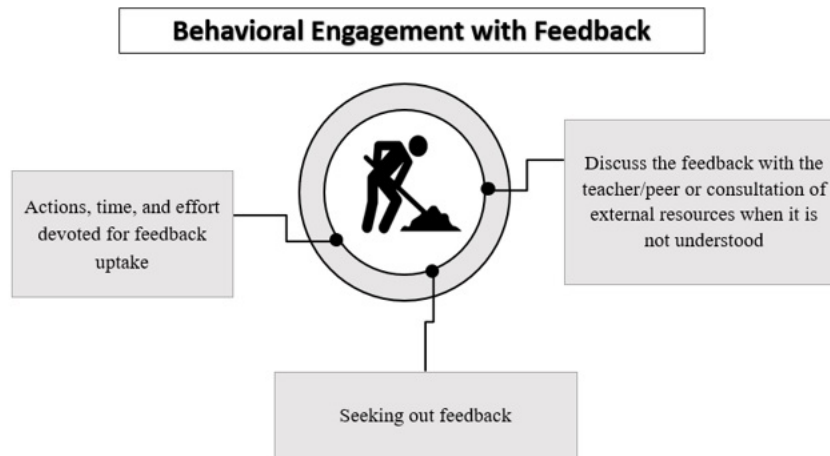
In a general sense, behavioral engagement is mainly drawn from the idea of actual involvement in learning and authentic participation in academic/social/extracurricular tasks (Fredricks et al., 2011). It is generally demonstrated by the student’s compliance with behavioral norms, such as active participation in discussions, attendance, asking questions, persistence, discipline, effort, attention, positive conduct, and the absence of disruptive behaviors (Christenson et al., 2012; Fredricks et al., 2011).

In an attempt to situate this understanding about behavioral engagement in this study’s focus on engagement with feedback, this chapter draws from Bennett’s (2011) interesting analogy; the real work of scientists starts after collecting data, which they interpret and make inferences from to determine what to do next. Likewise, the real work in formative assessment begins after students receive feedback data, which presents an opportunity for improvement, where they start to dedicate their time and effort to refining their work accordingly. In principle, acting on the interpreted information embedded in the feedback to improve learning is the most critical part of the formative assessment process (Molloy et al., 2020) because it is where the learning gap is approached and closed (Carless, 2019). Therefore, skimming the feedback alone without further remedial actions to drive the ongoing progress makes the overall formative assessment process not only incomplete but also pointless (Handley et al., 2011).

Specifically, behavioral engagement with feedback is all about the “acting element” that is manifested in the students’ actions take up the feedback (Cengiz & Ayvaci, 2017; Van der Kleij, 2020). In this sense,

behaviorally engaging with feedback implies committing their time and energy to the engagement with and implementation of the received information (Molloy et al., 2020; Van der Kleij, 2020). Figure 4 summarizes the key features characterizing behavioral engagement with feedback.

Figure 4. Key features characterizing behavioral engagement with feedback



More explicitly, the literature on engagement with feedback highlights several activities that demonstrate behavioral engagement with feedback (see Table 4). For instance, students may revise their assignments in response to the feedback (Han & Xu, 2021; Mahfoodh, 2017) or record feedback, such as keeping an error log or practice book to take notes, whether it is for future use or for reviewing errors (Van der Kleij, 2020). Behavior engagement with feedback also includes student consultation of external resources such as using supplemental materials as references or requesting post-feedback discussions with teachers and peers to obtain further clarification or resolve any misunderstanding (Man et al., 2021). Furthermore, when students themselves willingly seek feedback from others, this is considered behavioral engagement with feedback (Carless & Boud, 2018). Another common behavioral orientation toward feedback is making action plans (to set goals or actions for improvement in response to the

Table 4. Categorization of activities/indicators reflecting behavioral engagement with feedback (Source: Rabbani, in press)

Activities/Indicators	
<b>Behavioral Engagement</b>	<ul style="list-style-type: none"> <li>● Undertake productive strategies to act on the feedback (Carless &amp; Boud, 2018).</li> <li>● Record the feedback for future reference (e.g., make notes) (Van der Kleij, 2020).</li> <li>● Revise work in response to the feedback (Ali et al., 2015; Han &amp; Xu, 2021; Mahfoodh, 2017; Man et al., 2021).</li> <li>● Be proactive in seeking feedback (Carless &amp; Boud, 2018).</li> <li>● Consult external or supplemental resources, such as using learning materials as references (Man et al., 2021).</li> <li>● Make action plans (Ajjawi et al., 2022; Winstone &amp; Nash, 2016).</li> <li>● Discuss the feedback with the teacher or peers when it is not understood (Man et al., 2021).</li> </ul>

### 3D Feedback

feedback) (Ajjawi et al., 2022). Despite being a promising strategy to encourage engagement (Winstone et al., 2017), unfortunately, it is rarely used by students (Van der Kleij, 2020).

In reality, many of the above-listed self-regulated and actionable learning strategies are all believed to be rarely performed by students (Han, 2017). For instance, Hyland (2003) found that some students might decide to exert minimal or no effort to make corrective revisions in order to resubmit their work. It is probably easier for students to correct and work on errors that demand the least amount of effort, as long as doing so satisfies the teacher’s request. However, they might have some kind of reluctance to spend extra time on analyzing and rectifying errors that are more complex or responding to feedback that demands fundamental or drastic changes. This seemed especially true in the case where the amendments applied by the students would not change their grades. Such a desire for easy work may tend to increase as students advance from elementary to middle school, as argued by Christenson et al. (2012). This could partly be explained by the students’ desire for quick wins; therefore, they regard feedback that asks for superficial changes or on-the-spot corrections as more applicable (Carless & Boud, 2018). In contrast, more advanced or demanding feedback somehow forces students to expand their learning beyond their comfort zones, which naturally feels like a quite challenging or unpleasant situation, though it is where growth and intellectual development occur (Molloy et al., 2020). For these reasons, the ability to elicit the students’ willingness to invest in feedback information for their own benefit and of their own accord becomes the main challenge, which is a rather difficult undertaking for both the teacher and the student. Table 5 offers examples of responses that showcase how the behavioral element can be included in feedback.

Table 5. Examples of feedback responses demonstrating the inclusion of the behavioral element in feedback

Feedback Element	Purpose	Feedback Phrase	Advantage
Behavioral	To enable students to translate feedback into actions	<i>You have successfully attempted to..., which is great. Now, why not move to the next level and...</i>	Clarifies the following action or performance goal
		<i>The steps listed below will help you to... Here is an example of how these standards might be used in the assignment.</i>	Provides supportive instruction, approaches, or resources to implement the demanded goals

## DISCUSSION AND RECOMMENDATIONS

Overall, and in view of the three dimensions of engagement with feedback explained above, it is important to note that the aforementioned provisions that students need to possess or undertake in order to effectively engage with 3D feedback are essential components of feedback literacy (Sadler, 2010; Zhan et al., 2023). This considers engagement with feedback as a multifaceted construct that involves cognitive capacity, affective disposition, and social capacity, and it assumes that the unbalanced development of these facets often limits such engagement (Han & Xu, 2021). For instance, according to Carless and Boud (2018), a feedback-literate student is one who appreciates feedback, makes judgments, manages one’s own affects, and takes action in response to feedback. Likewise,

more recent frameworks of feedback literacy have incorporated the following elements: appreciating feedback as an active process, committing to feedback as improvement, eliciting feedback information to improve learning, processing feedback information, acknowledging and working with one's emotions, acknowledging feedback as a reciprocal process, and acting on feedback information to achieve outcomes (Molloy et al., 2020). Nonetheless, taken collectively, these provisions of feedback literacy should not be regarded as a finite list.

It is also important to bear in mind that there are varying opinions on the allocation of these provisions across the different dimensions of engagement (Christenson et al., 2012; Fredricks et al., 2004). For instance, provisions may be labeled as cognitive in some contexts and behavioral in others (Fredricks et al., 2016). Regardless of this, various activities that might reflect the complexity of the engagement with feedback construct in different dimensions (visible/invisible) need to be considered when discussing student interaction with the teacher feedback in a holistic manner.

In sum, students need to understand their role as agents in their learning process, which shall be demonstrated through the productive use of feedback input, which interchangeably stresses the teachers' role in steering their feedback practices in ways that allow this to occur (Carless, 2022; Jørgensen, 2019). Such interactive roles between teachers and students will help coordinate their dependence on each other (Rabbani et al., 2022), resulting in a more collaborative feedback relationship (Ajjawi et al., 2022).

## **CONCLUSION**

The key contribution of this work comprises its insights on how to help make feedback feel engaging so that it can be utilized in meaningful ways with clear purposes. Fundamentally, students do have a central role in the process as they are expected to emotionally, cognitively, and behaviorally engage with the feedback, which calls for an educational shift in the practice. The current discussion therefore presents a multidimensional approach to engagement with feedback (3D feedback) that helps create a sense of emotional, cognitive, and behavioral engagement. Under the conditions explained thoroughly in this chapter, feedback can be used more purposefully and skillfully to become worthwhile for learning.

## **FUTURE RESEARCH DIRECTIONS**

One important area of potential research that can be tackled as an extension to the current work involves the practical implications of the discussed multidimensional approach to engagement with feedback (3D). Generally, limited evidence about the impact of engaging feedback strategies is available in the literature. As such, new research agenda should empirically test the effectiveness of existing approaches and interventions of these strategies. Generating such in-action and evidence-based findings on feedback strategies that have proven effective is indeed highly beneficial for teacher education and professional development programs.



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# Chapter 20

## Alternative Assessment Methods: Moving Beyond Standardized Testing

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### ABSTRACT

*The chapter delves into the realm of educational assessment, emphasizing the pivotal role it plays in understanding learners' skills and competencies. It scrutinizes the flaws of the standardized testing methods as primary assessment tools. It advocates for a shift towards alternative assessment methods. The chapter addresses concerns surrounding subjectivity, reliability, fairness, and validity in alternative assessments, providing strategies to ensure their effectiveness. The chapter also outlines practical steps to support teachers in implementing alternative assessments. Balancing alternative assessments with standardized tests is also explored, highlighting the importance of thoughtful curriculum mapping. Finally, the chapter discusses overcoming barriers to implementation, emphasizing the need for comprehensive training and seamless integration into curriculum and instruction. By adopting alternative assessment methods, educational institutions can enhance the quality of evaluation and promote a more inclusive and comprehensive approach to assessing student achievement.*

### INTRODUCTION

#### Definition and Importance of Assessment in Education

Within the education realm, 'assessment' is a multidimensional and systematic process deployed to gather knowledge regarding the skills, abilities, and competencies constituted by the learner (Tosuncuoglu, 2018). It encompasses dynamic range of techniques and methodologies including observations, class

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tests, discussions, and projects to gauge the learner's individual understanding, academic performance and application of concepts within the provided context (Wilson, 2018).

Assessment is a critical segment of teaching and learning endeavor, supplementing the instructors in recognizing the strengths and weaknesses and offering productive feedback, enhancing the student learning. However, it is immensely pivot for the assessment to be aligned with the learning objective and customized in accordance to the learner's academic needs, facilitating the amplification of the teaching strategies with optimization of the educational outcomes (Mohan, 2023).

### **Critique of Standardized Testing as the Primary Assessment Method**

Standardized assessments within educational institutions have been providing inaccurate information regarding academic proficiencies of the diversified background-based learner (Cawthon et al 2013). According to Shavelson Klein & Benjamin (2009), Merely providing scoring guidelines, even with the use of benchmark responses for rater training, falls short in guaranteeing consistent grading standards. Rear (2019) quoted several researches which raised concerns regarding reliability and authenticity of the standardized tests as primary assessment method in context to their sub-scales. Five scales of the CCTST illustrated reduced internal consistency from 0.21 to 0.52, reported by Leppa (1997).

Unstable reliability, poor/lacking construct validity, reduced comparability between two types, were the flaws found by Ku (2009) in his conducted comprehensive review. The study conducted by Loo & Thorpe (1999) demonstrated the similar results for low reliability WGCTA sub-scales varying from 0.17 to 0.74. Other deficiencies noticed by Liu, Frankel & Roohr (2014), were non-comparable test forms, unreliable sub-scores, in appropriate evidence regarding distinctive dimensionality, and lacking differential validity across the test-taking student groups (Jandigulov et al., 2023).

### **Overview of the Chapter's Focus on Alternative Assessment Methods**

The chapter delves in the potential alternative assessment methodologies, offering a thorough and critical exploration beyond the standardized testing of the learners. It emphasizes the significance of assessment in education, encompassing various techniques to gather information about student abilities, comprehension, and motivation. The discussion extends to the drawbacks of relying solely on standardized testing, shedding light on the benefits of adopting alternative approaches (Abdalah & Alkaabi,2023).

## **BRIEF EXPLANATION OF ASSESSMENT AND ITS ROLE IN EDUCATION**

### **Different Types of Assessments (Formative, Summative, Diagnostic)**

Since 1960's educationists have been differentiative between summative and formative assessments which has led to recognizing the roles or evaluation programs in the development of curriculums (Dolin et al 2018). The main objective of formative assessments has been to facilitate the learners, while summative assessments focused on providing specific knowledge regarding what has to be learned at a specific time.

## Alternative Assessment Methods

Table 1. Standardized tests practiced in different countries derived from Morris (2011)

COUNTRY	STANDARDIZED TEST
AUSTRALIA	National Assessment Program in Literacy and Numeracy (NAPLAN)
CANADA	Pan-Canadian Assessment Programme (PCAP)
CHILE	Sistema de Medición de Calidad de la Educación (SIMCE)
NEW ZEALAND	National Education Monitoring Project
UNITED STATES	National Assessment of Educational Progress (NAEP)

Unfortunately, there has been substantial researches conducted by pedagogical experts on the potential of formative assessments in context to assisting the student's learning on daily basis (Kemp & Scaife, 2012). Diagnostic assessments can be categorized as formal, informal such as pretests and surveys, utilized to assess the student learning at the beginning of course/unit or semester. Table 2 summarizes the key differences between formative, summative, and diagnostic assessments below.

Table 2. Types of assessments derived from Marzuki (2023)

TYPE OF ASSESSMENT	PURPOSE	TIMING	EXAMPLES
FORMATIVE	Monitor student learning during instruction	During instruction	Quizzes, checkpoints, observations, asking questions
SUMMATIVE	Measure student learning at the end of a unit or course	After instruction	Exams, essays, projects
DIAGNOSTIC	Assess student learning at the beginning of a unit or course	Before instruction	Pre-tests, surveys

## The Limitations of Relying Solely on Standardized Testing

According to Rapps (2017), contemporary education in the United States leans heavily on standardized testing as a quantitative measure to assess the quality of education. The incorporation of standardized tests dates back to the 1800s, marking a longstanding tradition within international educational reforms. Medina & Neill (1990) extensively discussed how standardized tests produce inconsistent, inaccurate, and biased towards low-income and minority students.

Due to their narrow scope, standardized tests mainly focus on limited set of skills and knowledge which results in practicing a curriculum 'taught to test' and is insufficient to address other critical aspects of learning such as problem solving and critical thinking (Ellicott, 2022). As cited by Gaertner & Roberts (2017), Duckworth & Yeager (2015) explained that these tests failed to capture performance on non-cognitive competencies among the learners such as teamwork, perseverance and agile leadership (Awad, & Al Adwan, 2023). Hence, there is an immediate need of implementing hybrid or a mix of assessments methods to attain a clear picture regarding student learning (Rust, 2004).

## **CHALLENGES OF STANDARDIZED TESTING**

### **Brief Overview of Standardized Testing and its Drawbacks**

According to Morris (2011), standardized tests have limitations that undermine their ability to achieve their goals. These limitations include their narrow scope, both in terms of what they measure and how deeply they measure it. Kane et al (2002) explained how standardized tests were flawed due to inaccurate accountability measures. Using standardized test scores as the sole basis for school and teacher evaluations can lead to misleading conclusions about performance. Serin (2015) cited the research conducted by Stiggins (2001) explaining about the misalignment evident between what is being taught in the curriculum and what is being assessed on the standardized tests.

### **Negative Impact on Teaching and Learning**

Taylor et al (2001) elaborates how standardized testing enables a stressful environment for the learners and instructors both as high-stakes testing is involved. This potentially influences the teaching practices. Tilfarlioglu (n.d.) and Rapps (2017) confirmed that such assessments enable the practice of 'teach-to-test' approach which inhibits the learner's capability to effectively implement critical thinking skills while facing real life-based challenges. 'Teach-to-test' phenomenon also hinders an effective teaching approach as educators do not have sufficient time to teach more solutions to a specific problem. Students academic approach is adversely affected as they are depended upon a singular initiative when addressing the problems (Rapps, 2017).

### **Pressure on Students and Teachers**

Abdul Latif (2021) indicated that the high-stake nature of the standardized tests leads to heightened stress levels and anxiety among the learners. The overemphasis on the testing undermines the natural curiosity of the students for acquiring knowledge and ultimately results in reduced intrinsic motivation (Mostafa, 2017). The introduction of standardized testing has amplified the already existing pressure on teachers to meet educational standards (Shine & O'Donoghue, 2013). Curtin University's education studies department asserted that these tests would subject teachers to 'incredible pressure'. The Teachers' Union echoed this sentiment, emphasizing that the tests imposed undue stress on teachers to ensure their students performed well (Shine & O'Donoghue, 2013).

### **Narrow View of Student Abilities**

According to Almeida et al (2010) the Gardner's theory of multiple intelligence places emphasis that learners constitute diverse forms of intelligence including kinesthetic, linguistic, musical and interpersonal. The standardized tests tend to favor/promote only logical-mathematical intelligence and linguistic based and negating the other valuable forms. Students may excel in areas not covered by standardized assessments, such as arts, athletics, or vocational skills (Sternberg, 2003).

This narrow focus can inadvertently downplay the importance of these talents in a holistic education. As explained by Casner-Lotto & Barrington (2006), soft skills such as critical thinking, effective communications, and problem solving are integral for progression within higher education and profes-

## Alternative Assessment Methods

sional life. However, the standardized tests have the inability to measure such competencies providing an incomplete picture of a student's preparedness for real-world challenges.

## ADVANTAGES OF ALTERNATIVE ASSESSMENT

### Introduction to Alternative Assessment Methods

The term 'alternative assessment methods' is commonly used to denote a shift away from traditional assessment methods, aiming to enhance educational outcomes (Tan, 2012). For instance, those critical of the limitations of standard objective tests advocate for various alternative approaches such as portfolio assessment (Darling-Hammond, 1995), classroom-based assessment (Janisch et al 2007), performance-based assessment (Belanoff & Dickson, 1991), and authentic assessment (Wiggins, 1991).

However, Maclellan, (2004) explains the frequent and vigorous use of this term without a clear-cut definition, or a definite framework warrants concern. The research cautioned that the broad array of terms proposed as examples or variations of alternative assessment indicates a lack of consensus regarding its precise meaning. These terms, encompassing constructive assessment, embedded assessment (Wilson & Sloane, 2000), authentic assessment, performance assessment (Baker et al 1993), and direct assessment, all fall under the umbrella of alternative assessment methods. The different assessment approaches have been explained in the table below:

*Table 3. Types of Assessments approaches derived from Tan (2012), Wilson & Sloane, (2000), Baker et al (1993), Darling-Hammond, (1995), Janisch et al (2007), Belanoff & Dickson, (1991), and Wiggins, (1991).*

Assessment Type	Definition	Similarities	Examples	Contrasts
<b>Portfolio assessment</b>	A collection of student work that is used to assess their learning over time.	It is a holistic approach to assessment, and it allows students to demonstrate their learning in a variety of ways.	Writing samples, essays, research projects, and creative projects.	Portfolio assessment takes more time to prepare and assess than other types of assessment.
<b>Classroom-based assessment</b>	Assessment that takes place within the classroom, using a variety of methods such as tests, quizzes, homework assignments, and class participation.	It is the most common type of assessment, and it is used to monitor student learning on a daily or weekly basis.	Multiple choice tests, short answer tests, essays, and presentations.	Classroom-based assessment can be less formal than other types of assessment, but it is also less likely to be standardized.
<b>Performance-based assessment</b>	Assessment that requires students to demonstrate their skills and knowledge by performing a task, such as giving a presentation, writing a report, or solving a problem.	It is a hands-on approach to assessment, and it allows students to apply their learning to real-world situations.	Giving a presentation, writing a report, solving a problem, or creating a product.	Performance-based assessment can be more time-consuming to prepare and assess than other types of assessment.
<b>Authentic assessment</b>	Assessment that is relevant to students' lives and that requires them to apply their learning in real-world contexts.	It is a meaningful approach to assessment, and it helps students to see the value of their learning.	Writing a persuasive letter to a local newspaper, creating a marketing campaign for a new product, or developing a lesson plan for a student classroom.	Authentic assessment can be more difficult to design and implement than other types of assessment.
<b>Constructive assessment</b>	Assessment that is used to provide feedback to students to help them improve their learning.	It is a formative approach to assessment, and it is used to help students identify their strengths and weaknesses and to develop strategies for improvement.	Peer review, self-assessment, and teacher feedback.	Constructive assessment is less likely to be used for summative purposes than other types of assessment.
<b>Embedded assessment</b>	Assessment that is integrated into the learning process and that is used to monitor student progress on a regular basis.	It is a seamless approach to assessment, and it allows teachers to assess student learning without having to set aside specific time for testing.	Quizzes, homework assignments, and class participation.	Embedded assessment can be less formal than other types of assessment, but it is also less likely to be standardized.
<b>Direct assessment</b>	Assessment that directly measures a specific skill or knowledge.	It is a precise approach to assessment, and it can be used to identify students who need additional support.	Multiple choice tests, short answer tests, and essays.	Direct assessment can be less holistic than other types of assessment, and it may not be representative of students' overall learning.



## **Promoting Deeper Understanding and Critical Thinking**

Baker (1993) noted ‘performance assessment’ permits the students to practice and instructors to implement comprehensive understanding of different academic concepts and application of knowledge. Such approach encourages the learners to elevate their creativity, critical thinking and think out of the box. For the instructors, it offers authentic and enriched data on student performance and permits for in-depth evaluations. Wiggins (1990) explained with authentic assessments students are encouraged to develop higher order thinking skills, problem solving and critical thinking competencies. Authentic assessments present real-world tasks that are relevant, engaging, foster motivation and creativity (Wiggins, 1990).

## **Assessing Diverse Skills and Talents**

Embedded Assessment permits an in-depth holistic evaluation of the several competencies, skills, and talents comprised by the students. Such an assessment is seamlessly integrated in the learning process. This includes the affective, cognitive and practical skills (Wilson & Sloane, 2000).

## **Encouraging Active Student Participation**

Constructive assessment actively engages students in the learning process. It encourages them to take ownership of their learning and to actively seek feedback for improvement (Luxton-Reilly & Denny 2010). Embedded assessment promotes active participation as it is an ongoing, integral part of the learning experience. It encourages students to consistently engage with the material and seek feedback for continuous improvement (Wilson & Sloane, 2000).

## **TYPES OF ALTERNATIVE ASSESSMENT METHODS**

### **Performance-Based Assessments (Presentations, Projects, Portfolios)**

In the early 20<sup>th</sup> century, educational reforms led to the development of ‘performance-based assessments’ which mandates the learners to demonstrate their academic competencies and acquire knowledge through performing a task (Gallavan, 2009). As compared to traditional tests, this type is often more authentic and permits the learners to apply knowledge to real-world situations. They are immensely utilized all around the educational institutions not limited to UK, Australia, USA, Canada, and New Zealand. Prominent examples are learners giving presentation, writing formal/informal reports, solving a problem, conducting researches, developing portfolio, and designing experiments (Kirmizi, & Komec, 2016). The documented benefits of this approach in existing literature is: elevated motivation, improved engagement, and deeper learning.

### **Authentic Assessments (Real-World Tasks, Simulations)**

Originally Jay McTighe and Grant Wiggins introduced the concept of ‘authentic assessments’ in their book ‘Understanding by Design (1998)’ - they emphasized the importance of assessing students’ understanding through tasks that are meaningful and relevant to the real world (Nithia, Yusop, & Chua, 2020).

## **Alternative Assessment Methods**

Authentic assessments are evaluation methods designed to mirror real-world situations and tasks. They aim to gauge a student's ability to apply knowledge and skills in practical contexts rather than merely testing their ability to recall facts or perform well on standardized tests (Abdallah et al., 2023).

Authentic assessment approaches have attained popularity throughout international educational institutions; it is being practiced in Singapore, UK, and USA. Students are provided a complicated scenario or a real-world problem and tasked to find an optimal solution. They are also engaged in activities that stimulate real world situations. Teachers also provide hypothetical situations or real where learners apply their knowledge and make informed decisions (Nithia, Yusop, & Chua, 2020).

## **Self-Assessment and Peer Assessment**

According to Spiller (2012) self and peer assessment involve the learners in evaluation process where they critically reflect on their work and evaluate their peer's work. These methodologies have proved to promote critical thinking, meta-cognition, and in-depth understanding of the success criteria. In self-assessment learners analyze and evaluate their own project/task against the rubric or criteria or learning objectives. For example, the learner may assess his essay on the basis of clarity, organization and usage of evidences.

In peer-assessments, the learners evaluate the work of their peers using the same predetermined criteria. However, this can be done anonymously with providing constructive feedback. Spiller (2012) further explained that Self-assessment and peer assessment empower students to take an active role in their own learning and develop a deeper understanding of the criteria for success. Research has shown that when implemented effectively, these methods can lead to improved learning outcomes and a greater sense of ownership over one's own learning (Abdallah et al, 2023).

## **Assessment Through Technology (Online Quizzes, Multimedia Projects)**

With the advent of computers, internet and information technology, came the concept of conducting assessment through technology. Digital tools and platforms are utilized by the instructors to evaluate and assess the academic performance of the students. This approach leverages the capabilities of technology to create, administer, and analyze assessments. It encompasses various forms, including online quizzes, multimedia projects, virtual simulations, and computer-adaptive tests.

Learners take tests, quizzes or exams through Google Forms, Quizlet, LMS (Learning Management Systems) such as Canvas and Moodle which facilitates online quizzes. Multimedia projects allow students to demonstrate their knowledge and skills in a format that mirrors real-world tasks. This authenticity can lead to deeper learning and application. E- assessments were immensely effective and instrumental during COV SAR pandemic ensuring interrupted education. It offered flexibility and innovative learning models (Sarwa et al 2021).

## **IMPLEMENTING ALTERNATIVE ASSESSMENT**

### **Steps to Design Effective Alternative Assessments**

According to Corcoran, Dershimer, & Tichenor (2004) before designing a dynamic alternative assessment, it is immensely critical for the educational institution to identify the learning objectives that the

assessment will measure. Depending upon the academic needs and gaps, either educational institutions can select a specific type of alternative assessment or adopt a blend of the approaches.

Afterwards a clear and concise assessment criterion is developed by the educationists. For evaluating the effectiveness of the assessment, it is critical to pilot test the approach with a small group of learners in order to attain a productive feedback and devise mandatory revisions. It also allows for adjustments and ensures validity and reliability. Finally, ongoing reflection and refinement of assessment strategies based on student performance and feedback are essential for continuous improvement (Koç, & Ölmez-Çağlar, 2023).

### **Aligning Assessments With Learning Objectives**

Ensuring alignment between assessments and learning objectives is fundamental for meaningful evaluation. Educators must first articulate clear, specific, and measurable learning objectives. Then, they should design assessments that directly address these objectives, evaluating the intended knowledge, skills, and competencies (Daugherty et al 2008). This alignment enhances the validity of assessments, providing accurate insights into students' progress towards achieving the desired learning outcomes. Research shows that well-aligned assessments contribute to improved learning and higher levels of student achievement (Ramadan & Ismail,2023).

### **Creating Rubrics for Clear Grading Criteria**

Devising specific and clear grading criteria through rubrics or predetermined criteria is integral for consistent and transparent assessment procedure. A well organized and constructed rubric outlines the expectations for varying levels of performance, offering the learners with a clear direction on how to attempt the task or assigned project by the instructor (Brookhart, 2013). This transparency reduces ambiguity and ensures fair evaluation. Studies have demonstrated that the use of rubrics leads to more reliable and valid assessment outcomes, as well as improved student understanding of assessment criteria.

### **Incorporating Student Input in Assessment Design**

According to Roach et al (2010) including the input of the learner within the assessment design empowers the students, and drives a sense of ownership over their academic pursuits. Collaborative approach includes the involvement of the students in determining the criteria, assessment methods and even co-creating rubrics at university level. Such initiatives not only improve the student engagement but also drives meta-cognition and self-regulation. Research indicates that when students have a voice in assessment processes, they demonstrate increased motivation, deeper understanding of learning objectives, and a more positive attitude towards assessments.

## **EXAMPLES OF ALTERNATIVE ASSESSMENT**

### **Case Studies Showcasing Successful Implementation**

Research by Chaplin (2009) illustrates that case studies enhance decision-making competencies, problem-solving, and critical thinking. Successful implementation of case studies requires well-structured prompts

### ***Alternative Assessment Methods***

and clear evaluation criteria to ensure meaningful learning outcomes. Murane et al (2005) documented that case studies are powerful source of assessment tactics, permitting the learners to apply their knowledge to the real-world situations. For instance, in business courses, students might analyze a company's financial data and propose strategies for improvement (Abdallah & Abdallah,2023).

### **Project-Based Assessments in STEM Subjects**

Studies by Capraro, & Jones (2013) and Sunyoung et al (2016) emphasized the benefits of project-based learning, including increased engagement, deeper understanding, and improved problem-solving skills. Successful implementation involves clearly defined objectives, scaffolded support, and opportunities for student choice and creativity. For example, Old Dominion University and Norfolk State University, in partnership with the marine industry and local schools, are improving STEM education for students and teachers in major shipbuilding and repair areas through the MarineTech and SBRCDC projects. MarineTech has served 60 students in grades 8-12 over three years, providing 144 hours of instruction and hands-on learning in marine engineering and physical sciences, with a focus on shipbuilding (Verma, Dickerson, & McKinney, 2011).

### **Portfolios as a Comprehensive Assessment Tool**

McMullan et al (2003) reports portfolios comprise of collection of learner's works over the academic year, offering holistic view of their learning journey. Students in linguistic classes, portfolios constitute reflective essays, poems, and creative writing samples. Tekian & Yudkowsky (2009) sheds light on portfolios promoting self-reflection, self-assessment, and the development of metacognitive skills. Successful portfolio assessment requires clear guidelines, regular feedback, and opportunities for students to showcase their growth and achievements (Alqodsi,, 2023).

### **Role-Playing and Simulations in Social Sciences**

According to Tsergas, & Fragkos, (2021) role playing fosters empathy, historical understanding and critically understanding the academic concepts. Successful implementation involves well-defined roles, structured debriefing, and opportunities for reflection on the experience. The National Council for the Social Studies (NCSS) has developed a variety of rubrics for assessing student work in social studies. These rubrics can be used to assess a variety of alternative assessments, such as essays, projects, and presentations.

## **ADDRESSING CONCERNS AND CHALLENGES**

### **Addressing Concerns About Subjectivity and Reliability**

The implementation of clear predetermined criterion and deployment of multiple evaluators is critical. Utilization of the established grading criteria and offering particular examples of varying performance levels facilitate the mitigation of subjectivity. Furthermore, the inter-rater reliability techniques are implemented, the multiple assessors evaluate the same work independently, ensuring consistent scoring

method. Drawing from the principles of Generalizability Theory, educators can use statistical methods to estimate and enhance the reliability of alternative assessments.

### **Strategies for Ensuring Fairness and Validity**

Universal design principles have been successful in ensuring fairness and validity within alternative assessments. By offering multiple means of expression, representation and engagement, assessments become highly accessible to diverse learners. Incorporating principles from the Theory of Fairness in Testing, educators can carefully review and revise assessment items to ensure they are free from cultural or gender-related biases (Abdallah, & Musah, 2023).

### **Providing Support for Teachers to Implement Alternative Assessments**

Aligned with the Constructive principles, offering workshops, and T&D on effective assessment designed, educators are equipped with the competencies to develop constructive alternatives for assessment purposes. Mentorship programs, where experienced educators guide their peers in assessment development, can be highly effective. Utilizing communities of practice, educators can collaborate and share best practices for alternative assessment implementation. Instructors can collaborate and coordinate the benchmarking practices and drive a culture of collaborative learning (Abdallah, & Farhan, 2023).

### **Balancing Alternative Assessments With Standardized Tests**

Thoughtful curriculum mapping and assessment design becomes mandatory for balancing the alternative assessments with the standardized tests. Utilizing principles from the Authenticity Framework, educators can align assessments with learning objectives to ensure a comprehensive evaluation of student performance. According to the Weighted Compensatory Model, the educational institutions can assign adequate weighting to varying types of assessments including both alternative and standardized assessments as to reflect their relative significance in the overall evaluation process. By strategically integrating alternative assessments alongside standardized tests, schools can provide a more holistic evaluation of student achievement.

## **OVERCOMING BARRIERS TO IMPLEMENTATION**

### **Training and Professional Development for Teachers**

For the effectiveness and successful progression of alternative assessments, instructors are required to be highly competent and knowledgeable regarding the professional and ethical criteria of assessing students (Almaktoum & Alkaabi, 2024). Workshops, seminars, and ongoing coaching focused on assessment design, rubric development, and data interpretation are required as a part of their training and professional development (Al-Zoubi et al., 2023; Ibrahim et al., 2024). By incorporating principles from Adult Learning Theory, training programs should be learner-centered, relevant, and provide opportunities for practice and reflection (Alkaabi, 2023; Alkaabi et al., 2023; Alkaabi & Almaamari, 2020).

### **Alternative Assessment Methods**

Moreover, with the adoption of TPACK model, instructors can efficiently incorporate technology within assessment practices.

### **Integrating Alternative Assessments Into Curriculum and Instruction**

Successful integration of alternative assessments into curriculum and instruction requires deliberate planning and alignment with learning objectives. Utilizing principles from Understanding by Design (UbD), educators should start by identifying desired learning outcomes and then design assessments that authentically measure these outcomes. Additionally, incorporating Formative Assessment techniques throughout instruction allows for ongoing feedback and adjustment of teaching strategies. By embedding alternative assessments seamlessly into the curriculum, educators can ensure that assessment practices are purposeful, meaningful, and directly contribute to student learning (AlQodsi & Aljahoori, 2023).

### **Gaining Support From Stakeholders (Parents, Administrators)**

Fulfilling stakeholder's expectations and interests is a pivotal segment of attaining support from them as to academically progress the educational institution in pursuit of assessments. The educational institutions engage with the parents/ guardians via consistent communications, workshops and seminars. Administrators play a key role in providing resources, time, and support for teachers to implement alternative assessments effectively (Abdallah, 2023). By advocating for the value of alternative assessments in improving teaching and learning, administrators can create a culture that prioritizes these assessment practices (Alqodsi et al, 2023).

## **FUTURE TRENDS/DIRECTIONS IN ASSESSMENT**

### **Emerging Trends in Assessment Methods**

Literature indicates a significant shift towards more competency-based approaches placing emphasis on learners mastering specific competencies or knowledge areas, permitting for extensive flexibility in progression and pacing. Moreover, the performance assessments, which mandate the learners to implement their knowledge in authentic projects are attaining prominence. These trends align with the principles of Constructivist learning theory, emphasizing active engagement and real-world application of knowledge.

### **The Role of Technology in Shaping Assessment**

Technology has played a substantial role in improving the overall framework of different assessments. For example, the computer-adaptive testing customizes the questions to the learner's proficiency levels, offering more accurate and precise measure of their capabilities. Furthermore, multimedia projects and e-portfolios permit for dynamic and interactive demonstration of the skills. The use of Artificial Intelligence (AI) and machine learning is also on the rise, enabling automated scoring and providing valuable insights into student performance patterns. Moreover, the COV SARS pandemic necessitated a rapid shift to remote and hybrid learning, prompting a reevaluation of assessment practices. Online proctor-

ing and secure digital platforms became essential for administering high-stakes assessments (Abdallah & Alkaabi, 2023).

## **The Potential Impact on Educational Practices and Policies**

The evolving landscape of assessment is likely to influence educational practices and policies in substantial ways. Competency-based models may lead to more flexible learning pathways, allowing students to progress at their own pace. Moreover, the integration of technology will require a reevaluation of access and equity in education (Ismail et al, 2023). Policy makers may need to consider issues of digital divide and ensure all students have equal opportunities for assessment. Additionally, the data generated from technology-enabled assessments will inform evidence-based decision-making in education, potentially driving changes in curriculum and instructional practices (Darawsheh et al, 2023).

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### **About the Contributors**

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# Index

5E 6-8, 10

## A

Active learning 14-41, 43, 53, 56, 69-70, 80-82, 299  
 Adaptive Leadership 132-133  
 AI 108, 142, 147, 166-168, 170-181, 184, 187, 195-205, 207-208, 210, 212-217, 220, 224, 227-228, 245, 255-256, 263, 265-266, 313  
 AI in Special Education 195-197, 203, 205  
 AI technologies 187, 195-198, 201, 203-205, 212-215, 219  
 Appraise 120-121, 124-125  
 Artificial Intelligence (AI) 108, 166-167, 178-179, 181, 187, 196-198, 201, 203-204, 212-213, 215-216, 220, 224, 228, 263, 266, 313  
 Attend 77, 120-121, 125, 128-129, 186  
 Authentic Assessment 53, 232, 307, 309, 317, 319  
 Authentic Leadership 131, 133  
 authentic learning 31, 43, 68-72, 78-82

## B

behavioral 18, 65, 67, 114, 116-117, 153-158, 170, 270, 273, 288-290, 295-298

## C

Chatbots 166-181, 255  
 classroom-based assessment 303, 307  
 Coaching 100-101, 105, 107, 111, 113-114, 117-118, 179, 312  
 cognitive 3, 7, 15-16, 18-20, 28, 33, 39-41, 46, 80, 154-155, 157-158, 170, 179, 181, 206-207, 248, 252-253, 263, 286, 288-290, 292-295, 297-298, 308  
 Collaborative Learning 20, 22-23, 28, 30, 34-35, 72-73, 110, 120-121, 186, 232-233, 246-247, 312  
 Constructivism 1-2, 13-14, 32, 41, 78, 81-82  
 Course redesign 68-69

Creative Learning 62

Critical Thinking 2, 5, 8, 13-15, 19-25, 29, 33, 35-36, 42-49, 52-53, 55, 58-59, 65, 69-70, 78, 93, 142, 155, 173, 175, 223-224, 232-235, 240, 246, 249, 258-259, 287, 302, 305-306, 308-310, 317-318  
 Cultural Intelligence (CQ) 149-150, 154, 157-159, 165  
 Culture 18, 61, 71, 76, 86, 88, 90, 92-93, 96-97, 101, 103, 105, 110, 112, 120, 127, 129-132, 136-137, 139-142, 149, 151-153, 155-161, 184, 187-188, 192-194, 222, 224, 232, 244, 263, 268, 272, 277, 284, 312-313

## D

data analysis 7, 106, 254, 269, 272, 276, 278, 280, 282  
 Data-Driven 10, 39, 86-88, 95, 100, 105, 110, 145, 183-184, 188, 191-194, 199, 201, 208, 218, 221, 227, 262, 267, 272, 277, 280-283, 316  
 Data-Driven Insights 105, 183, 188, 201  
 Delegate 120-121, 125-126  
 Democratic Leadership 122, 133  
 Develop 2-3, 6, 11, 14-17, 20, 22-26, 28, 32-33, 42, 44-49, 58-59, 67, 69-71, 105-106, 108, 120-122, 125-127, 129, 133, 136-138, 141-142, 158, 170, 182, 187, 214, 233-237, 241, 243, 248-253, 257, 260-261, 268, 272-274, 308-309, 312  
 Developmental Millstones 13  
 Digital Age 23, 66, 92, 97, 142, 166, 182-183, 188-189, 191-194, 222-223  
 Distributed Leadership 89-90, 93, 95, 97, 99, 126, 131-133, 184, 186  
 Diversity Climate 149, 159, 162  
 Diversity Management 149-150, 158-159, 165

## E

EdTech Leadership 93  
 education 2, 9-15, 18-33, 35-36, 38-41, 43-45, 49-52, 54-74, 76-82, 84-100, 102-107, 110-118, 128,

131-147, 157, 159, 161-164, 166-168, 171-230, 232-233, 235-236, 244-249, 251, 255-268, 271, 279-285, 298-306, 309, 311, 314-320

Educational assessment 267, 303, 316

Educational Innovation 98, 190, 232

educational technology 28, 57, 62-64, 80, 95-96, 98, 113, 134, 143, 176, 179-180, 184, 191-192, 194, 206, 210, 222, 224, 227-229, 263, 266, 283

Educators 2, 6, 9, 16, 21, 32, 36, 38, 42, 44-45, 47, 49, 54-55, 57-61, 68-70, 79, 84-90, 92-93, 97, 102-103, 105-111, 116, 118, 120, 134-141, 166-168, 175-176, 182, 184, 186-189, 195-205, 207, 213-214, 216-224, 243, 248-249, 251-252, 255-258, 261, 268-275, 281-282, 286, 288-290, 306, 310, 312-313

Effective Learning 27, 32, 42, 168, 186, 202, 268

Emirati education 267

emotional 15-16, 20, 22, 28, 131, 133, 170, 173, 176, 180, 248-259, 264, 286, 288-293, 298, 301

Empower 17, 42, 57-59, 120, 136-137, 189, 204, 309

Enhance 6, 14, 16, 22, 31-34, 36-37, 42, 44, 46-49, 56, 58-60, 68-71, 75, 77, 79, 84, 102-103, 105-107, 109-111, 115, 117, 120-121, 123-125, 138-139, 151, 166, 169-172, 175-176, 185-188, 196-197, 199, 201, 204, 214-215, 218, 221, 246, 263, 272, 274, 281, 302-303, 307, 310, 312

Enjoy 120-121, 125, 127-129, 155, 234

Ethical AI Integration 195, 213

Ethical Leadership 131, 133, 223-224, 229

## F

Feedback 6, 8-10, 15, 21, 23, 38-39, 44, 56, 69-71, 88, 93-94, 100, 102-103, 105-108, 110-113, 117, 120-122, 130, 133, 141, 144, 167, 169-172, 175-176, 186-187, 190, 208, 219, 226, 232-246, 252-255, 259-260, 262, 266-267, 269, 271-272, 274, 276, 278, 280-281, 285-295, 297-302, 304, 308-311, 313, 315

Flipped Classroom 13, 25, 36, 80-81, 319

formative assessment 13, 40, 47-49, 66, 244, 273-274, 281-282, 284-288, 294-295, 299, 313, 316-317

## G

Gamification 21, 29, 54-58, 61-67, 71, 187-188

general education 67-69, 79

## H

Holistic Assessment 248-249, 252-260

## I

Improve 6, 14-16, 19-23, 25, 40, 45, 50-51, 56, 65, 69-71, 85, 87-88, 97, 102, 105-106, 109, 111-112, 114-115, 118, 120-121, 124, 130, 134, 136-137, 139-141, 151, 167-168, 171-172, 175, 177, 182, 185, 196, 199-201, 210, 216, 232-238, 240, 242, 246, 253-255, 259-260, 267-268, 272-273, 280-281, 283-284, 287, 291, 295, 298, 310, 318

Inclusion 54, 67, 97, 110, 125, 147, 158-159, 162, 202-203, 228, 264-265, 279, 297

Innovation 11, 40, 44-46, 58, 62, 68-70, 73-80, 84-86, 88-90, 92-93, 95-99, 101, 104, 110, 134-142, 144-147, 151, 153, 158, 171, 190, 192-193, 199, 201, 205, 209, 213, 228, 232, 263-264, 271, 281, 284, 317

Innovative Evaluation 248

Innovative Technologies 84-85, 93, 176, 186

Inquiry 1-7, 9, 11-12, 17, 19, 23, 44, 46, 53, 80, 111, 131, 179, 184, 194, 198, 268, 290

Inquiry-Based Learning 1, 3, 5, 9-11, 16, 45, 53, 69

## L

Laws 35, 40, 196-197, 201, 205, 212-222, 224

leaders 50, 68, 71, 75-76, 78, 84-94, 97, 100-101, 105, 115-117, 124, 126, 130, 134-141, 143, 146, 149-153, 156-159, 182-185, 187-189, 191, 193, 206, 223, 225, 227, 261, 268, 276, 280, 284, 314

Leadership 10-11, 26, 38-40, 50-51, 61, 63-65, 71, 81, 84-86, 88-101, 103-104, 111-116, 118, 120-122, 124, 126-133, 135-138, 140, 142-147, 149, 153, 158-159, 161-162, 164-165, 177, 179, 181-182, 184-194, 206-209, 211, 213-214, 223-229, 244, 251, 261-265, 280-284, 302, 305, 314-318

Leadership Strategies 84, 93

Learning-Centred Leadership 133

Legal Considerations 195-196, 213-214

Legal implications 196-197, 212-214, 216

## M

Machine Learning (ML) 166, 171, 256

Mentor 120-121, 125, 129, 132

Mentoring 92, 100-102, 105-106, 110-111, 115-118, 129, 139, 245

## Index

metacognition 14, 16, 31, 34, 47, 52, 155, 161-162, 232, 241

Motivate 23, 56, 69, 120-121, 125, 134, 136, 234, 243

## N

Natural Language Processing (NLP) 166, 170

Non-Academic Skills 248-252, 255, 257-261

## O

Organizational Identification (OI) 165

## P

Peer Review 6, 232-247

performance-based assessment 303, 307, 316-317

portfolio assessment 303, 307, 311

problem-based learning 31, 33-34, 46, 50-53, 69, 247

Problem-Based Strategies 42

professional development 10, 37-38, 47-49, 58, 85-86, 92, 94, 96, 101-102, 105-108, 110-111, 113-116, 119-121, 123-124, 130, 134-135, 138-139, 144, 184-186, 188-190, 193-194, 197, 199-200, 204-205, 208, 210, 223-224, 226, 249, 262, 269, 272-273, 275, 278, 280-281, 298, 312, 315

Progressive Educational Governance 84-85

Project-Based Learning (PBL) 42, 44, 50, 53

## R

Recruit 120-121, 123, 125

Respect 3, 20, 71, 73, 80, 87, 121, 125, 127, 129, 131, 136-137, 141-142, 157, 217, 223-224, 238, 242, 258, 260, 292

Retain 7, 94, 139, 142, 242, 272

## S

school effectiveness 138, 267

school evaluation 267, 279, 282

School Improvement 10-11, 26, 39-40, 50, 64-65, 94-96, 98, 100, 111-112, 143-147, 150, 177, 179, 181, 184, 189-192, 206, 208-209, 225-229, 244, 261-262, 264-265, 267-272, 274, 276-285, 314-318

Self-Reflection 19, 100, 105, 107, 111, 223, 235, 241, 311

Servant Leadership 131-133

Situational Leadership 126, 133

special education 54-59, 61-64, 66, 191, 195-205, 207, 209-210, 265, 271, 301

Special Needs 21, 26, 50, 54-61, 63-65, 67, 95, 143, 145, 174, 177, 189, 196-206, 208, 225-226, 244, 261-262, 277-278, 282, 314, 316

STEM 1-2, 6, 10-11, 26, 34-35, 39-40, 52, 96, 112, 118, 145-146, 178, 191-192, 208-209, 228, 263-264, 284, 311, 316-317, 319

Student Engagement 6, 14, 23, 31, 35, 41, 47, 70, 98, 100-102, 111, 167-168, 178, 187, 232, 245, 255, 286, 288-290, 299-302, 310

student progress 168, 175, 268, 270, 272, 274-275, 280-281, 286

Student-Centered Learning 52, 248

Students 1-9, 11-17, 20-26, 28-38, 41-82, 85-89, 92, 94-98, 102-103, 108, 110-116, 118, 120-121, 124, 127-128, 130, 134-137, 139-143, 145-147, 155, 157, 166-190, 192, 194-210, 213-214, 216, 218-220, 222-226, 228, 232-241, 243-266, 268-282, 286-302, 305-306, 308-312, 314-319

Students with Special Needs 26, 50, 54-61, 63, 95, 143, 145, 174, 177, 189, 195-206, 208, 225-226, 244, 261-262, 278, 282, 314, 316

Sustained Learning Observation 100

## T

Teacher Growth 10, 38, 94, 103, 116, 144, 190, 208, 226, 262, 315

Teacher responsibilities 212-213, 220, 224

Teacher Retention 92, 105

Teaching 1-2, 6, 10-13, 15-16, 20-21, 25-27, 29-31, 33-36, 38-39, 41-47, 49, 51-52, 54-58, 60-62, 64-66, 68-70, 73, 78-79, 81-82, 86-87, 89, 92, 94-97, 99-103, 105-106, 108, 110-111, 113-114, 116, 118, 120-121, 128-129, 131-134, 136-140, 142-144, 150, 167-168, 172, 174-176, 179, 182, 184, 186-193, 196, 200-201, 206-209, 214, 220, 222-227, 229, 232, 235-236, 245-247, 252, 254-256, 259, 261-263, 265-269, 271-273, 278-285, 290, 299-302, 304, 306, 313-317, 319

technology 6, 10, 14-15, 22-23, 25-26, 28, 36, 39, 41, 47-48, 50-52, 54-55, 57-66, 68-70, 77, 79-81, 84-89, 91-100, 105-106, 108-109, 111-113, 115-117, 120, 123, 134-135, 137-138, 140-143, 145, 147, 159, 167-168, 172-173, 175-189, 191-194, 198-199, 201, 203-204, 206-211, 215-217, 220-225, 227-229, 246, 248-250, 254-255, 261-266, 283, 309, 313-314, 316, 319

Technology Integration 89, 99, 115, 182, 186-187

Transformational Leadership 86, 89-90, 93, 95, 98-99, 131, 133-137, 140, 144, 146, 162, 165, 185-186, 188, 190, 192, 194

Transforming 56, 61-62, 66-67, 76, 87, 110, 121,  
130, 138, 167, 176, 182-183, 185, 193-194, 276,  
283, 317

## **U**

undergraduate students 68, 245, 300

## **V**

Values-Based Leadership 103, 132-133

## **W**

Workforce Diversity 149-152, 160-161, 163-164