Universitas: Journal of Global Research and Innovation
Excellence. Quality. Reliability. Service | Contributing to the Body of Knowledge

Real-Life Situations: Towards a Well-Managed Virtual Mathematics Class

Jann Clark A. Ramirez
Angelo L. Loyola Senior High School
https://doi.org/10.5281/zenodo.24030236

ABSTRACT

The transition to online learning during the COVID-19 pandemic significantly transformed educational practices and underscored the need for effective pedagogical strategies in Mathematics instruction. Given the abstract nature of mathematical concepts, the integration of real-life situations has been recognized as a valuable approach for promoting meaningful learning and improving students' conceptual understanding. This study examined the practices of Mathematics teachers in integrating real-life situations into online learning and explored how such practices contribute to strengthening pedagogy in Mathematics education. Specifically, the study investigated the lesson components in which real-life situations were incorporated, the strategies employed by teachers, the challenges encountered during implementation, and the perceived advantages of contextualized instruction. A qualitative descriptive research design utilizing documentary analysis was employed. Data were gathered from Eight-Week IDEA Lesson Exemplars, learning activities, seatworks, and assessment materials prepared by Mathematics teachers during the first quarter of School Year 2021–2022. The collected documents were analyzed using thematic content analysis involving coding, categorization, and theme development. Findings revealed that real-life situations were most frequently integrated in the Development phase, particularly in the "What Is It" section, followed by the "What I Can Do" and "What's More" sections. Integration was most evident in lessons involving functions and their applications. Challenges were observed in contextualizing highly abstract topics and competencies with limited real-world applicability. Despite these challenges, the use of real-life situations enhanced logical thinking, problem-solving skills, learner engagement, creativity, and conceptual understanding. The study concludes that contextualized instruction remains an effective strategy for strengthening Mathematics pedagogy in online learning environments and supports the development of meaningful and learner-centered learning experiences.

Keywords: *online learning, mathematics education, contextualized instruction, real-life situations, experiential learning, IDEA lesson exemplar, mathematics pedagogy, documentary analysis, teacher practices, qualitative research*

INTRODUCTION

The rapid advancement of digital technologies has significantly transformed educational practices worldwide. Technology-enhanced learning environments have expanded opportunities for flexible, accessible, and learner-centered instruction, reshaping how knowledge is delivered and acquired in contemporary education. This transformation became particularly evident during the COVID-19 pandemic, when educational institutions were compelled to transition from traditional face-to-face instruction to various forms of distance and online learning. In response to prolonged school closures, education systems worldwide adopted alternative learning modalities to ensure the continuity of instruction. In the Philippines, the Department of Education implemented online, modular, and blended learning approaches to accommodate the diverse needs and circumstances of learners.

Online learning has emerged as a critical component of educational delivery due to its capacity to provide continuous access to learning resources regardless of geographical and temporal constraints. However, the effectiveness of online learning is influenced not only by technological infrastructure but also by the pedagogical approaches employed by teachers. Research suggests that meaningful learning experiences require instructional strategies that actively engage learners, encourage collaboration, and connect academic concepts to real-world contexts (Almaiah et al., 2020; Borba et al., 2021). Consequently, educators continue to explore pedagogical practices that can promote student engagement and understanding in virtual learning environments.

Among school subjects, Mathematics remains one of the most challenging disciplines to teach and learn in online settings. Mathematical concepts are often abstract in nature and may be difficult for students to comprehend when presented solely through symbols, formulas, and procedural exercises. Students frequently encounter difficulties in relating mathematical principles to practical situations, which may result in reduced engagement and lower conceptual understanding. To address these challenges, educational researchers advocate the use of contextualized instruction that links mathematical concepts to authentic experiences and real-life situations (National Council of Teachers of Mathematics [NCTM], 2020).

The integration of real-life situations into Mathematics instruction promotes meaningful learning by enabling students to understand the relevance and applicability of mathematical concepts in everyday life. Contextualized learning experiences encourage learners to analyze authentic problems, formulate solutions, and apply mathematical reasoning to situations they may encounter outside the classroom. Such instructional practices support

the development of higher-order thinking skills, problem-solving abilities, creativity, and learner engagement.

Several studies have explored various dimensions of online learning and technology integration in education. Almaiah, Al-Khasawneh, and Althunibat (2020) identified technological readiness, instructor competence, institutional support, and student engagement as critical factors influencing the effectiveness of online learning systems during the COVID-19 pandemic. Similarly, Adarkwah (2021) reported that online learning enabled educational continuity during the pandemic but also exposed students to numerous challenges, including inadequate internet connectivity, limited access to technological resources, and reduced opportunities for meaningful interaction.

Within Mathematics education, Borba et al. (2021) emphasized the transformative role of digital technologies in facilitating collaboration, inquiry, and knowledge construction. Their study highlighted the importance of designing learning experiences that move beyond mere content delivery and encourage students to engage with mathematical ideas in authentic contexts. Likewise, the NCTM (2020) emphasized that technology should serve not only as a delivery mechanism but also as a tool for connecting mathematics to real-world situations and meaningful applications.

Recent investigations have also demonstrated that contextualized Mathematics instruction contributes positively to student learning outcomes. When mathematical concepts are embedded in familiar and relevant contexts, learners are more likely to demonstrate improved conceptual understanding, motivation, and problem-solving performance. Furthermore, experiential and context-based pedagogies have been shown to foster active participation and meaningful engagement, particularly in technology-mediated learning environments. Studies by Barrot et al. (2021), Hew et al. (2020), and Kapasia et al. (2020) further highlight the importance of innovative instructional approaches that can sustain learner engagement and participation in online settings.

The growing importance of online learning and technology integration in education, particularly in response to the disruptions brought about by the COVID-19 pandemic. Previous studies have established that online learning can support educational continuity and provide flexible learning opportunities for students. Researchers have identified several factors that influence the effectiveness of online instruction, including technological readiness, instructional design, teacher competence, institutional support, and student engagement (Almaiah et al., 2020; Adarkwah, 2021). Within Mathematics education, scholars have likewise emphasized the potential of digital technologies to enhance conceptual understanding, collaboration, problem-solving skills, and learner participation when supported by effective pedagogical practices (Borba et al., 2021).

The literature further demonstrates the value of contextualized and experiential approaches in Mathematics instruction. Studies indicate that integrating real-life situations into Mathematics lessons promotes meaningful learning by enabling students to connect abstract mathematical concepts to authentic experiences and practical applications. Through contextualized instruction, learners develop stronger analytical thinking, problem-solving abilities, motivation, and conceptual understanding. These findings are consistent with Kolb's Experiential Learning Theory, which posits that knowledge is constructed through experience, reflection, conceptualization, and application.

Despite the growing body of literature on online learning, Mathematics education, and technology-enhanced instruction, a notable gap remains in existing research. Much of the current literature has focused on students' online learning experiences, technological challenges, learning outcomes, virtual learning environments, and general pedagogical strategies. Comparatively few studies have examined the specific practices employed by Mathematics teachers in integrating real-life situations into online instructional materials, particularly within IDEA Lesson Exemplars used in secondary education.

Furthermore, limited research has explored where and how contextualized learning experiences are embedded within various components of online Mathematics lessons, the challenges encountered by teachers during implementation, and the perceived advantages of utilizing real-life situations as a pedagogical strategy. This gap is significant because contextualization has been identified as a critical approach for promoting meaningful and learner-centered Mathematics instruction, especially in online learning environments where opportunities for direct interaction may be limited.

To address this gap, the present study investigates the integration of real-life situations in Mathematics lesson exemplars utilized during online learning. Specifically, it examines the lesson components where real-life situations are incorporated, the strategies employed by teachers, the challenges encountered during implementation, and the benefits derived from contextualized instruction. By providing empirical evidence on teachers' pedagogical practices, the study contributes to the growing body of knowledge on online Mathematics education and offers practical insights for strengthening pedagogy in virtual learning environments.

The present study seeks to address the identified gap by examining the practices of Mathematics teachers in integrating real-life situations into online learning. Specifically, it investigates how teachers utilize real-world experiences in lesson delivery, the parts of the lesson where these situations are incorporated, the benefits derived from their use, and the challenges encountered during implementation. By exploring these dimensions, the study aims to contribute to the enhancement of Mathematics pedagogy in online learning

environments and provide evidence-based recommendations for teachers, school leaders, curriculum planners, and future researchers.

The study is anchored on experiential learning principles, which assert that knowledge is constructed through meaningful experiences and reflection. The findings are expected to enrich existing literature on online Mathematics education and support the development of pedagogical strategies that foster meaningful and contextualized learning experiences. Anchored specifically on Kolb's Experiential Learning Theory, the study recognizes that learners construct knowledge through concrete experiences, reflective observation, abstract conceptualization, and active experimentation. Integrating real-life situations in Mathematics instruction provides learners with authentic opportunities to connect abstract mathematical concepts with experiences encountered in everyday life.

Research Problem

The transition to online learning has transformed the delivery of Mathematics instruction and highlighted the need for innovative pedagogical approaches that promote meaningful learning. Although numerous studies have explored the effectiveness of online learning, student engagement, technological challenges, and instructional strategies, relatively few have examined how Mathematics teachers integrate real-life situations into online lessons to strengthen pedagogical practices.

The absence of direct face-to-face interaction in online environments may limit opportunities for students to relate mathematical concepts to their everyday experiences. Consequently, there is a need to investigate how teachers contextualize learning through authentic situations and practical applications. Moreover, understanding the benefits and challenges associated with integrating real-life situations into online Mathematics instruction may provide educators with effective strategies to improve student engagement and conceptual understanding.

This study addresses the gap in existing literature by exploring the practices of Mathematics teachers in utilizing real-life situations within online learning environments and determining how these practices contribute to strengthening mathematics pedagogy

Objectives of the Study

To examine the practices of Mathematics teachers in integrating real-life situations into online learning and determine how these practices contribute to strengthening pedagogy in Mathematics education.

Specifically, the study seeks to:1. Describe the profile of the Mathematics teachers participating in the study. 2. Identify the instructional documents and materials utilized in online Mathematics instruction. 3. Determine whether real-life situations are integrated into Mathematics lessons and identify the specific lesson components where they are applied. 4. Examine the strategies employed by teachers in incorporating real-life situations into online Mathematics learning. 5.Identify the challenges encountered by teachers in utilizing real-life situations during online instruction. 6. Determine the perceived advantages of integrating real-life situations into Mathematics teaching.

Conceptual or Theoretical Framework

This study is anchored on Kolb's Experiential Learning Theory (ELT), which posits that learning is a process through which knowledge is created through the transformation of experience. According to Kolb, effective learning occurs through a cyclical process involving concrete experience, reflective observation, abstract conceptualization, and active experimentation. Learners develop understanding when they experience, reflect upon, conceptualize, and apply knowledge in authentic contexts.

The theory emphasizes the importance of connecting learning experiences to real-life situations. In Mathematics education, this approach allows learners to relate abstract concepts to everyday experiences, making learning more meaningful and relevant. Through the integration of real-life situations, students are encouraged to actively engage in problem-solving, critical thinking, and knowledge construction, thereby enhancing their conceptual understanding and retention of mathematical concepts.

Guided by this theoretical perspective, the study examines how Mathematics teachers utilize real-life situations in online learning environments and how such practices contribute to improved pedagogy. The conceptual framework assumes that the integration of real-life situations serves as an instructional strategy that influences students' engagement, understanding, and learning experiences. The effectiveness of this integration may be affected by various factors, including teachers' pedagogical practices, instructional resources, and challenges encountered during implementation.

METHODOLOGY

This study employed a qualitative research approach to explore how Mathematics teachers integrate real-life situations into online learning and how such practices contribute to strengthening pedagogy. Qualitative research is particularly appropriate when the objective is to gain an in-depth understanding of educational practices, experiences, and perspectives within their natural context. The approach enables researchers to examine complex educational phenomena through the interpretation of textual and documentary evidence, thereby providing rich and meaningful insights that may not be captured through quantitative measures.

Specifically, this study utilized documentary analysis as its primary qualitative method. Documentary analysis involves the systematic review, examination, and interpretation of existing documents to elicit meaning, gain understanding, and develop empirical knowledge. Through the analysis of lesson exemplars, instructional materials, seatworks, and assessment tasks, the study examined the extent to which real-life situations were integrated into Mathematics instruction during online learning.

Research Design

This study employed a qualitative descriptive research design, specifically utilizing documentary analysis. Documentary analysis is a systematic procedure for reviewing and evaluating printed and electronic documents to identify patterns, themes, and meanings relevant to a particular research problem.

The design was deemed appropriate because the study sought to investigate how real-life situations were incorporated into Mathematics instruction through existing educational documents rather than through manipulation of variables or measurement of numerical outcomes. The approach allowed the researcher to analyze authentic instructional materials used by teachers during online learning and to identify pedagogical practices related to contextualized Mathematics teaching.

Through documentary analysis, the researcher examined lesson exemplars, learning activities, seat works, and assessment materials to determine the presence, nature, and utilization of real-life situations in Mathematics lessons. The findings provided insights into current pedagogical practices and contributed to understanding how online Mathematics instruction may be strengthened through contextualized learning experiences.

Research Locale or Study Setting

The study was conducted in Angelo L. Loyola Senior High School implementing online learning modalities during School Year 2021–2022. The participating schools adopted distance and online learning approaches in response to educational adjustments brought about by the COVID-19 pandemic.

The study setting was considered relevant because online learning served as the primary mode of instructional delivery during the period under investigation. Consequently, teachers were required to develop and implement lesson exemplars suited to virtual learning environments. These instructional documents provided valuable sources of data for examining the integration of real-life situations in Mathematics teaching.

Participants or Data Sources

The primary data sources of the study consisted of instructional documents prepared by Mathematics teachers at Angelo L. Loyola Senior High School teaching under online learning modalities during School Year 2021–2022.

Specifically, participating teachers provided copies of their Eight-Week IDEA Lesson Exemplars for the First Quarter. These documents served as the primary units of analysis in the study. The IDEA Lesson Exemplar consists of four major phases: Introduction (I), Development (D), Engagement (E), and Assimilation (A).

Selection of the documents was based on the following inclusion criteria: The lesson exemplars were developed and implemented during online learning. The lesson exemplars were designed for Mathematics instruction. The documents covered the First Quarter of School Year 2021–2022. Teachers voluntarily agreed to provide copies of the instructional materials for research purposes.

The selected lesson exemplars were considered adequate sources of information because they reflected actual pedagogical practices employed by teachers in delivering Mathematics lessons within online learning environments.

Research Instruments or Materials

The primary research materials consisted of: Eight-Week IDEA Lesson Exemplars; Learning activities and seatworks embedded in the lesson exemplars; Assessment tasks, quizzes, and examination materials associated with the lessons; and a documentary analysis matrix developed by the researcher.

The documentary analysis matrix served as the primary analytical tool for organizing and categorizing information obtained from the documents. The matrix included categories such as: Presence of real-life situations; Lesson component where real-life situations were integrated; Type of real-life situation utilized; Instructional strategies employed; Perceived advantages; and Challenges associated with implementation.

The matrix facilitated systematic examination, coding, and thematic categorization of the collected documents.

Data Gathering Procedure

Prior to data collection, the researcher sought permission from school administrators and participating teachers to access relevant instructional documents. Upon approval, participating Mathematics teachers were requested to submit copies of their Eight-Week IDEA Lesson Exemplars and related instructional materials used during the First Quarter of School Year 2021–2022.

The collected documents were organized, catalogued, and reviewed to ensure completeness and relevance to the objectives of the study. Each document was assigned a code to protect the identity of the participating teachers and schools.

The researcher then conducted a careful and systematic examination of each document, focusing on the identification of real-life situations integrated into Mathematics lessons. Relevant excerpts, activities, assessments, and instructional strategies were documented and recorded in the documentary analysis matrix.

To ensure consistency and accuracy of interpretation, repeated readings of the documents were conducted, and emerging themes were continuously compared across data sources.

Data Analysis

The collected documents were analyzed using thematic content analysis. This method involved systematically identifying, coding, categorizing, and interpreting recurring themes and patterns within the instructional materials.

The analysis was conducted through the following stages:
1. Familiarization with the Data
All lesson exemplars and instructional materials were read multiple times to gain a comprehensive understanding of their content.

2. Initial Coding
Relevant portions of the documents containing evidence of real-life situations and pedagogical strategies were identified and assigned preliminary codes.

3.Categorization of Codes
Similar codes were grouped into broader categories corresponding to the research objectives, including: Integration of real-life situations; Lesson components where integration occurred; Pedagogical strategies employed; Advantages; and Challenges encountered.

4. Theme Development
Categories were synthesized into overarching themes that represented common patterns and pedagogical practices observed in the documents.

5. Interpretation and Reporting
The identified themes were interpreted in relation to the study objectives and the theoretical framework, particularly Kolb's Experiential Learning Theory.

Thematic analysis was selected because it enabled the researcher to uncover meaningful patterns in instructional practices and generate a comprehensive understanding of how real-life situations were incorporated into online Mathematics instruction.

Ethical Considerations

The study observed ethical principles throughout the research process. Permission to conduct the study and access instructional materials was obtained from the appropriate school authorities and participating teachers prior to data collection.

Participation was voluntary, and teachers were informed about the purpose of the study, the nature of their involvement, and the intended use of the collected data. Confidentiality and anonymity were maintained by assigning codes to all collected documents and removing any identifying information from the research records and final report.

All documents were used solely for academic and research purposes. Electronic and printed copies of the materials were stored securely and were accessible only to the researcher. The study adhered to institutional guidelines and ethical standards governing educational research, ensuring respect for participants' rights, privacy, and professional integrity.

RESULTS AND DISCUSSION

Results for Objective 1

Teachers	Sex	Age	Educational Attainment	Years in Teaching	Subject taught
1	M	47	• BS Industrial Education • MAT Mathematics - 21 units	13	Gen. Mathematics
2	F	32	• BS Applied Mathematics, • MA Education, Mathematics	6	Precalculus
3	M	37	• BSE, Mathematics	7	Gen. Mathematics
4	M	29	• BSE, Mathematics	7	Gen. Mathematics
5	M	38	• BSE, major in Math • MAT Mathematics, CARMA	13	Gen. Mathematics

Figure No. 1 Profile

Discussion of Objective 1

The participants consisted of four male teachers and one female teacher. Their ages ranged from 29 to 47 years old. Teaching experience ranged from 6 to 13 years. Four teachers handled General Mathematics, while one teacher handled Precalculus. Most participants possessed academic qualifications related to Mathematics education, with some pursuing graduate studies.

The profile of the teacher-participants indicates that the respondents possessed adequate professional preparation and teaching experience in Mathematics. Their educational backgrounds and years of service suggest sufficient exposure to pedagogical approaches and curriculum implementation. These qualifications may have contributed to their ability to design lesson exemplars and integrate contextualized learning experiences within online Mathematics instruction.

The findings support the notion that competent and experienced teachers play a significant role in the successful implementation of innovative pedagogical strategies in online learning environments.

Results for Objective 2

Document Type	**Purpose**
Eight-Week IDEA Lesson Exemplars	Primary instructional material examined for the integration of real-life situations
Learning Activities	Reviewed to identify contextualized learning tasks
Seatwork's and Exercises	Examined for the presence of authentic problem-solving situations
Assessment Tasks	Analyzed to determine the application of real-life situations in evaluation activities

Figure No. 2 Profile

Discussion of Objective 2

The primary documents analyzed in this study were the Eight-Week IDEA Lesson Exemplars prepared and implemented by the participating Mathematics teachers during the First Quarter of School Year 2021–2022.

The selected documents provided authentic evidence of teachers' instructional practices during online learning. Since these materials were directly utilized in classroom instruction, they offered reliable sources for examining how real-life situations were incorporated throughout Mathematics lessons.

Results for Objective 3

Parts of IDEA Lesson Exemplar		WEEK								TOTAL
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Introduction	*What I need to Know*	0	0	0	0	0	0	0	0	0
	What's New	0	3	1	0	1	1	0	1	7
Development	*What I know*	1	3	1	0	1	0	2	0	8
	What's In	2	2	0	0	0	0	1	1	6
	What Is It	2	3	1	1	4	3	3	1	18
Engagement	*What's More*	2	4	1	1	0	0	3	1	12
	What I Can Do	0	0	0	0	1	1	1	1	4
Assimilation	*What I Have Learned*	0	0	0	0	0	0	0	0	0
	What I Can Do	1	3	2	0	0	3	3	1	13
	Additional Activities	0	0	0	0	0	1	1	0	2

Figure No. 3 Integration of Real-Life Situations Across IDEA Lesson Components

Discussion of Objective 3

The data indicate that real-life situations were most frequently integrated in the "What Is It" section of the Development phase, with a total frequency of 18 occurrences. This was followed by the "What I Can Do" section of the Assimilation phase (13 occurrences) and the "What's More" section of the Engagement phase (12 occurrences). No integration was observed in the "What I Need to Know" and "What I Have Learned" sections.

The findings suggest that teachers preferred integrating real-life situations during concept development and application activities. This pattern indicates an effort to contextualize abstract mathematical concepts and provide opportunities for learners to apply knowledge in meaningful situations.

The predominance of real-life situations in the Development and Assimilation phases reflects the principles of experiential learning, wherein learners build understanding through authentic experiences and practical application. The absence of contextualized activities in introductory and reflection sections suggests areas where future lesson planning may further strengthen contextual learning.

Results for Objective 4

Mathematical Concept	**Application of Real-Life Situations**
Functions	Representation of everyday situations using functions
Piecewise Functions	Modeling scenarios with varying conditions
Rational Functions	Solving contextualized quantitative problems
One-to-One Functions	Demonstrating real-world relationships
Exponential Functions	Modeling population growth, savings, and other practical situations
Logarithmic Functions	Application in measurement scales and real-world phenomena

Figure No. 4 Applications of Real-Life Situations in Mathematics Lessons

Discussion of Objective 4

The findings indicate that real-life situations were primarily employed in competencies that naturally lend themselves to practical applications. Teachers used contextual examples to help students understand abstract concepts and recognize the relevance of Mathematics in daily life.

Such instructional practices are consistent with contextualized and constructivist learning approaches, which emphasize meaningful learning through authentic experiences and real-world problem-solving.

Results for Objective 5

Document analysis revealed several challenges associated with the integration of real-life situations into online Mathematics instruction.

Challenge	Description
Topic Limitations	Certain competencies focus primarily on symbolic manipulation and function identification, limiting contextualization opportunities
Abstract Content	Some lessons contain highly abstract concepts that are difficult to connect directly to real-life situations
Curriculum Requirements	The nature of specific competencies may not readily support contextualized examples
Precalculus Topics	Topics such as Conic Sections and Series were primarily presented through procedural approaches with limited real-life integration

Figure No. 5 Challenges in Integrating Real-Life Situations

Discussion of Objective 5

The findings indicate that curriculum content influences the extent to which real-life situations can be utilized in Mathematics instruction. While some topics naturally accommodate practical applications, others remain highly abstract and procedural in nature.

These challenges suggest the need for professional development opportunities that equip teachers with strategies for contextualizing even highly theoretical mathematical concepts.

Results for Objective 6

The documentary analysis identified several perceived advantages of integrating real-life situations into Mathematics learning activities.

Advantage	Description
Improved Logical Thinking	Encourages analytical and critical thinking skills
Enhanced Problem-Solving Skills	Develops learners' ability to solve everyday problems
Increased Engagement	Makes lessons more meaningful and relevant
Greater Creativity	Encourages students to explore multiple solutions
Better Conceptual Understanding	Facilitates connections between theory and practice

Figure No. 6 Advantages of Integrating Real-Life Situations

Discussion of Objective 6

The findings indicate that integrating real-life situations enhances students' learning experiences by making Mathematics more meaningful and relatable. Authentic problems encourage learners to apply mathematical knowledge in realistic contexts, thereby improving understanding and retention of concepts.

These findings support experiential learning principles, which suggest that students learn more effectively when instruction is connected to their daily experiences and real-world environments.

General Discussion

The findings of this study demonstrate that Mathematics teachers integrate real-life situations into online instruction primarily during concept development, engagement, and application activities. The documentary evidence showed that contextualized learning strategies were most utilized when teaching functions and their applications, where authentic scenarios could easily be represented mathematically.

The results further revealed that while teachers recognize the value of real-life situations in enhancing student engagement, logical reasoning, and problem-solving skills, challenges remain in applying contextualized instruction to highly abstract mathematical topics. These challenges highlight the importance of strengthening teacher capacity in designing contextualized learning experiences across different mathematical domains.

Viewed through the lens of Kolb's Experiential Learning Theory, the findings affirm that meaningful learning occurs when students connect mathematical concepts to authentic experiences. The integration of real-life situations promotes active engagement, knowledge

construction, and practical application, thereby strengthening pedagical practices within online learning environments.

Overall, the study contributes to the growing body of literature on online Mathematics education by demonstrating that contextualized instruction remains a valuable pedagogical approach even within virtual learning settings. The findings further suggest that curriculum developers, school leaders, and teachers should continue promoting the use of real-life situations to enhance Mathematics learning and strengthen pedagogy in online education.

REFERENCES

Adarkwah, M. A. (2021). I'm not against online teaching, but what about us? ICT in Ghana post Covid-19. Education and Information Technologies, 26(2), 1665–1685. https://doi.org/10.1007/s10639-020-10331-z

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the e-learning system usage during COVID-19 pandemic. Education and Information Technologies, 25(6), 5261–5280. https://doi.org/10.1007/s10639-020-10219-y

Barrot, J. S., Llenares, I. I., & Del Rosario, L. S. (2021). Students' online learning challenges during the pandemic and how they cope with them. Education and Information Technologies, 26(6), 7321–7338. https://doi.org/10.1007/s10639-021-10589-x

Borba, M. C., Askar, P., Engelbrecht, J., Gadanidis, G., Llinares, S., & Sánchez-Aguilar, M. (2021). The future of mathematics education since COVID-19: Humans-with-media or humans-with-non-living-things. Educational Studies in Mathematics, 108(1–2), 385–400. https://doi.org/10.1007/s10649-021-10043-2

Boud, D., Cohen, R., & Walker, D. (2017). Using experience for learning. Open University Press.

Carter, R. A., Rice, M., Yang, S., & Jackson, H. A. (2020). Self-regulated learning in online learning environments. Distance Education, 41(1), 1–16.

Day, T., Chang, I. C. C., Chung, C. K. L., Doolittle, W. E., Housel, J., & McDaniel, P. N. (2021). The immediate impact of COVID-19 on postsecondary teaching and learning. Professional Geographer, 73(1), 1–13.

Donitsa-Schmidt, S., & Ramot, R. (2020). Opportunities and challenges: Teacher education

in Israel during the COVID-19 pandemic. Journal of Education for Teaching, 46(4), 586–595. https://doi.org/10.1080/02607476.2020.1799708

Francisco, C. D., & Barcelona, M. C. (2020). Effectiveness of an online classroom for flexible learning. International Journal of Academic Multidisciplinary Research, 4(8), 100–107.

Hew, K. F., Jia, C., Gonda, D. E., & Bai, S. (2020). Transitioning to the "new normal" of learning in unpredictable times. Asian Journal of Distance Education, 15(1), 1–15.

Kapasia, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., Barman, B., & Das, P. (2020). Impact of lockdown on learning status among undergraduate and postgraduate students during COVID-19 pandemic in West Bengal, India. Children and Youth Services Review, 116, 105194. https://doi.org/10.1016/j.childyouth.2020.105194

Kolb, D. A. (2015). Experiential learning: Experience as the source of learning and development (2nd ed.). Pearson Education.

Lewis, L. H., & Williams, C. J. (2017). Experiential learning: Past and present. In L. Jackson & R. S. Caffarella (Eds.), Experiential learning: A new approach (pp. 5–16). Jossey-Bass.

National Council of Teachers of Mathematics. (2020). Catalyzing change in mathematics education: Initiating critical conversations. NCTM.

Singh, V., & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning. American Journal of Distance Education, 33(4), 289–306. https://doi.org/10.1080/08923647.2019.1663082

UNESCO. (2021). Education: From disruption to recovery. United Nations Educational, Scientific and Cultural Organization. https://en.unesco.org/covid19/educationresponse

Usher, M., & Barak, M. (2020). Team diversity as a predictor of innovation in team projects of face-to-face and online learners. Computers & Education, 144, 103702. https://doi.org/10.1016/j.compedu.2019.103702

Varea, V., & González-Calvo, G. (2020). Touchless classes and absent bodies: Teaching physical education in times of COVID-19. Sport, Education and Society, 26(8), 831–845. https://doi.org/10.1080/13573322.2020.1791814