# Project U (Union of Minds): A Facebook Mathematical Learning Tool for Grade 7 Learners

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## ABSTRACT

Digital learning platforms are reshaping educational environments, with social media tools like Facebook playing a central role in enhancing collaborative and interactive learning. This study examines Project U (Union of Minds), a Facebook Group specifically created as a learning platform to enhance engagement and improve mathematical skills in a Grade 7 Mathematics class. This study aimed to evaluate the effectiveness of Project U (Union of Minds) as a learning tool in Mathematical skills among learners specifically 1) determining pre-test result, 2) designing Facebook group, and 3) determining its effects as measured by post-test results and engagement. The research investigated how this platform supports student learning outcomes and fosters active participation and interaction in the learning environment. Using a quasi-experimental design specifically pre-test and post-test control group design, this study collected data from a sample of thirty Grade 7 students at San Antonio High School, who completed a 40-item pre-test and post-test based on Mathematics first-quarter competencies, as well as engagement surveys to measure active participation within the platform. Statistical analyses, including paired t-tests, were conducted to assess the significance of improvements between pre-test and post-test results. The findings reveal that Project U (Union of Minds) had a measurable positive impact on students' mathematical skills, engagement, and overall learning experience. The pre-test results indicated areas of need, which guided the design and content of the platform. The engagement analysis showed high levels of student interaction and motivation, with consistent participation in discussions and collaborative activities. Post-test scores reflected a highly significant improvement from pre-test scores, with a large effect size, confirming the platform's substantial impact on student performance. In conclusion, Project U (Union of Minds) proved to be an effective digital learning tool, significantly enhancing engagement and mathematical proficiency in a Grade 7 Mathematics class. Its structured, interactive design fostered a supportive environment that strengthened students' understanding and skills. These findings suggest that incorporating similar digital platforms into Mathematics instruction and potentially other subjects can boost student engagement and academic outcomes.

**Keywords:** Facebook group, mathematical skills, student engagement

## INTRODUCTION

This chapter introduces the study, which explores the use of Project U (Union of Minds) as a tool for enhancing learner engagement and learning outcomes in Grade 7 Mathematics. This sets the stage for understanding the role of social media in modern education and its potential to create a more interactive and effective learning environment.

In recent years, social media has emerged as a powerful tool in education, transforming traditional teaching methods. Particularly in mathematics education, social media platforms offer innovative ways to engage students, enhance learning experiences, and bridge the gap between theoretical concepts and practical applications. This paper explores the role of social media in teaching mathematics, examining its benefits, challenges, and implications for educators.

The use of social media in education has grown in importance in recent years, especially with the emergence of sites like Facebook that provide exceptional chances for group learning. Social media platforms are useful

instruments for education since they have revolutionized communication and knowledge exchange. Social media fosters a collaborative learning environment where students can share ideas, solve problems together, and provide peer support. Platforms like Facebook and Twitter enable students to form study groups, participate in discussions, and collaborate on projects beyond the classroom (Johnson, 2021). This collaborative aspect encourages active learning and helps students develop critical thinking skills. Social media provides access to a wealth of educational resources, including tutorials, webinars, and problem-solving sessions conducted by experts around the world. These resources offer students diverse perspectives and techniques, enriching their understanding of mathematical concepts (Brown, 2019).

Legislative initiatives like the Philippine Digital Workforce Competitiveness Act (Republic Act No. 11927) which was approved last October 23, 2023, which emphasizes the need to leverage digital technologies in education to enhance learning outcomes and prepare learners for the digital age, have brought attention to the importance of social media in education in the Philippines.

Social media usage in the classroom has been more popular locally, especially after the COVID-19 epidemic interrupted traditional school settings. Facebook groups were successfully utilized as substitute learning management systems to enhance learners' education in cities like Valenzuela (Abasola, 2023). Educators and students adapted quickly, finding creative solutions to continue the educational process despite the physical distance. Teachers used Facebook groups to post assignments, share resources, and facilitate discussions, creating a sense of community even in a virtual space. This shift not only helped maintain the continuity of education but also highlighted the versatility and potential of social media as a pedagogical tool. Moreover, the pandemic accelerated the adoption of social media in education, prompting schools to rethink the integration of digital tools into their curricula. Educators found that these platforms could be leveraged to cater to different learning styles, providing personalized learning experiences and supporting students with diverse needs.

Despite these developments, research on systematically integrating of social media platforms into the curriculum to improve learner engagement and mathematics skills is still need.

The increasing reliance on digital platforms for education and the need to optimize its utilization to enhance learning outcomes drives the urgency of this study. As learners progressively engage with social media, understanding how these tools can be used to enhance academic success, particularly in Mathematics, is essential. This study evaluates Project U's (Union of Minds) efficacy as a tool for learner engagement and mathematical skills enhancement to fill the gap in present educational methods.

In summary, the results of this study will help learners by providing insights into which digital technologies might improve their educational experiences. Instructors will acquire proficient comprehension of how to use social media in their pedagogical approaches, and academic establishments will be apprised of the capacity of these platforms to enhance learner skills, especially in mathematics.

The study supports the creation of practices and policies that leverage social media to promote education, and it also contributes to the broader learning in the Philippines about digital education.

### A. Scope and Delimitation

This study aimed to evaluate the effectiveness of Project U (Union of Minds) as a learning tool for mathematical skills among learners. The study focuses on Grade 7 learners from San Antonio High School who will use Project U (Union of Minds) as part of their Mathematics lessons during the first quarter of the school year 2024-2025. The research involves 30 respondents selected through total enumeration. Data will be collected through an adapted survey within Project U (Union of Minds). Moreover, this research is limited to the sample of learners. It does not include learners from other grades or schools. The study focuses solely on using Project U (Union of Minds) and does not consider other online platforms. The findings are specific to this group and may not apply to different settings. The study assessed short-term effects during the study period and did not explore long-term impacts.

### B. Objectives of the Study

This study aimed to evaluate the effectiveness of a Project U (Union of Minds) as a facebook learning tool in mathematical skills among Grade 7 learners.

## MATERIALS AND METHODS

To address the study's objectives, a survey questionnaire was used to assess the research objective. The questionnaire utilized a 4-point Likert scale to measure the learners' engagement level about using Project U (Union of Minds) as a learning tool.

Additionally, a 40-item test crafted by the researcher, aligned with the Table of Specifications (TOS) shown in appendix covering the topics for the first quarter was administered with the following learning competencies: Draw and describe regular and irregular polygons with 5, 6, 8, or 10 sides, based on measurements of sides and angles, using a ruler and protractor; Draw triangles, quadrilaterals, and regular polygons (5, 6, 8, or 10 sides) with given angle measures; Describe and explain the relationship between the angle pairs based on their measures; Classify polygons according to the number of sides, whether they are regular or irregular, and whether they are convex or non-convex; Deduce the relationship between the exterior angle and adjacent interior angle of a polygon; Determine the measures of angles and the number of sides of polygons; Solve problems involving percentage increase and percentage decrease; Solve money problems involving percentages (discount, commission, sales tax, simple interest); Create financial plan; Identify and explain the uses of rates; Solve problems involving rates (e.g. speed); Describe given rational numbers as fractions, decimals, or percentages; Order rational numbers on a number line; and Perform operations on rational numbers. This test was used to evaluate the learners' mathematical skills and to determine whether there were significant differences in these abilities before and after the implementation of Project U (Union of Minds).

All instruments were subjected to validity and reliability tests to ensure that they effectively measured the intended outcomes. As shown in Table 1, three master teachers assessed the clarity and relevance of each question. Adjustments were implemented based on their feedback. The guide’s validity was determined using Content Validity Index (CVI) by Muhamad Saiful Bahri Yusof, yielding an average score of 1 for S-CVI/Ave and S-CVI/UA which indicated high reliability and relevance. Before data collection, authorization was the sought from the school administration, and informed consent was obtained from grade seven learners' parents or guardians.

The survey and the test were administered twice—before and after the use of Project U (Union of Minds) —to assess the effectiveness of the intervention. The data collected helped to determine the impact of Project U (Union of Minds) on learner engagement and mathematical skills.

The study adheres to ethical standards to protect participants' rights and well-being. Privacy and secrecy were crucial throughout the study. Before data collection began, participants were informed of the study's objective and scope and given their consent. They were told their participation was optional and that they could leave the study at any time without penalty.

Each participant received a unique code to ensure data anonymity. Interviews and assessments were kept anonymous; only the researcher accessed the raw data. A researcher conducted standardized exams to assure data quality and consistency.

Electronic data were encrypted, while physical records were locked. It was only used for this study and not shared with others. After the research, all data was kept ethically and deleted to protect participant privacy.

Lastly, the research was carried out with respect for all participants, guaranteeing they were not subjected to harm or discomfort. Ethical authorization was obtained from the appropriate institutional review board before the study, ensuring that every aspect of the research complies with ethical standards.

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# RESULTS AND DISCUSSIONS

This chapter presents the study's findings on using Project U (Union of Minds) as a learning platform for enhancing Grade 7 students. The analysis begins with an overview of the student's initial performance based on the pre-test, followed by a detailed description of the intervention—the design and implementation of Project U—as a targeted response to address the areas identified as challenging. Finally, post-test and engagement results are analyzed to evaluate the impact of Project U on student learning outcomes, with findings compared to pre-test data to assess the effectiveness of this digital intervention and highlight how the platform fostered interaction.

## Effectiveness of Project U as a Learning Tool in Mathematics

In the rapidly evolving landscape of education, digital platforms offer innovative approaches to enhance student learning and engagement. "Project U (Union of Minds)" emerges as a pioneering initiative designed to harness the power of social media in the educational sphere. By leveraging a Facebook Group as a dynamic learning tool, Project U aims to address the challenges faced by Grade 7 students in mastering mathematical concepts. This study explores the efficacy of this digital intervention, assessing its impact on student engagement, comprehension, and overall mathematical proficiency.

## Performance of Students in the Pre-test Result (Analysis)

Before implementing Project U (Union of Minds) as a Facebook Group learning tool, the pre-test was conducted to gauge the baseline mathematical performance and skill level of the Grade 7 students. This pre-test was developed based on a table of specifications and consisted of 40 multiple-choice questions covering first-quarter competencies in Mathematics 7.

The pre-test results show that the mean score of the students was 12.8 out of 40, indicating that students had a low level of proficiency in the covered competencies before the intervention. The variance of 14.56 and the standard deviation of 3.82 suggest that there was moderate variability in the student's performance, with some students performing significantly below the mean as shown in table 3. This pre-test data provides a baseline for measuring the effectiveness of using Facebook as a learning intervention, offering a clear picture of the student's mathematical abilities prior to the intervention.

These findings align with research from Borba (2021), which emphasizes the challenges students face in mathematical proficiency in traditional learning, often worsened by limited access to interactive resources and peer collaboration. Borba's work highlights that digital platform can provide supplementary support to improve problem-solving skills and engagement with mathematical concepts. The pre-test performance offers a snapshot of the need for these interventions, as the students' low scores reflect gaps in understanding that require more engaging and collaborative learning tools.

The low pre-test scores indicate that the students were not adequately grasping the competencies at the beginning of the academic term, highlighting the need for enhanced instructional strategies. The moderate spread in performance suggests that while some students may have a foundational understanding, many require targeted intervention to close the performance gap. Given these findings, implementing an intervention through the Facebook Group aims to address these deficiencies by promoting higher engagement and offering additional resources to enhance critical thinking and mathematical problem-solving.

**Table 3**

*Performance of Students Before the Use of Facebook Group*

| Performance of Students | Mean ($\bar{x}$) | Standard Deviation | Interpretation |
|---|---|---|---|
| Pre–test | 12.8 | $\sqrt{14.56}$ | Low level |
| N = 30 | | | |

Legend:
32.01 – 40.00 (Very high level)
24.01 – 32.00 (High level)
16.01 – 24.00 (Medium level)
8.01 – 16.00 (Low level)
0.00 – 8.00 (Very low level)

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**Design**

Project U (Union of Minds) was created as a Facebook Group to enhance engagement and improve math skills among Grade 7 students. The platform was chosen for its accessibility and familiar format, aiming to make learning more interactive and supportive. Based on pre-test results, which highlighted key areas needing improvement, the group was designed to allow students to participate in discussions, collaborate on problem-solving, and engage with learning materials at their own pace.

The design of Project U included various resources like instructional videos, interactive lessons, and real-world math applications to cater to different learning styles. Features like question-and-answer sessions, peer discussions, and regular updates kept students actively involved and motivated. This structured, digital approach encouraged consistent engagement, supporting students as they strengthened their math skills in a collaborative, online environment. In addition, the summary table shown in table 4 discussed the input, process, and output of the mathematical intervention.

**Inputs**

**Specific Challenges in Students' Understanding.** The pre-test results were instrumental in revealing specific challenges that Grade 7 students faced in understanding mathematical concepts. The data highlighted gaps in students' comprehension, particularly in areas that required abstract reasoning and complex problem-solving skills. This analysis provided crucial insights into the aspects of the curriculum that were most problematic for students, underscoring the need for tailored educational strategies to address these challenges.

**Difficulty Index and Targeted Intervention.** The difficulty index, a metric used to assess the level of challenge presented by test items, indicated that many questions were rated as having moderate to significant difficulty. This finding pointed to the widespread struggles students faced with foundational mathematical concepts. Such results emphasized the necessity for a targeted intervention, one that would be specifically designed to bridge the gaps in understanding and improve students' problem-solving abilities. By identifying these areas of difficulty, educators were provided with a clear direction for developing interventions like Project U, which aimed to enhance the learning experience through interactive and engaging digital platforms.

Project U, or the Union of Minds, was developed in response to educational gaps identified during the pre-test analysis. This initiative utilized a Facebook Group to create an interactive learning environment tailored to Grade 7 students, focusing on problem areas to ensure the instructional content was relevant and capable of bridging gaps in mathematical understanding. By introducing Project U, a structured and collaborative learning space was provided, significantly enhancing students' mathematical skills. The use of multimedia lessons and real-world applications catered to diverse learning styles, making the process more enjoyable and facilitating deeper comprehension through practical application. Students were encouraged to engage with content, participate in discussions, and collaborate with peers, fostering a community-driven learning experience.

One of Project U's key features was its ability to offer personalized learning experiences, allowing students to interact with material according to their individual learning preferences, whether visual, auditory, or kinesthetic. This adaptability led to improved educational outcomes by enabling students to learn at their own pace and receive immediate feedback, thereby boosting their confidence and competence in mathematical concepts.

Project U's success is underpinned by its alignment with several prominent educational theories. Vygotsky's Social Constructivism is reflected in the project's collaborative nature, emphasizing the importance of social interactions in knowledge construction. Kearsley and Shneiderman's Engagement Theory is supported by elements of gamification and real-world applications, which actively engage students in project-based learning. Siemens' Connectivism is evident in the platform's digital nature, highlighting the role of digital networks in learning and creating a dynamic, adaptable environment.

The integration of social interaction, collaboration, and digital networks within Project U highlights the transformative potential of digital interventions in modern education. By significantly boosting student

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engagement and proficiency, Project U serves as a model for future educational strategies. The study underscores the importance of innovative approaches that utilize technology to complement traditional teaching methods, demonstrating how digital platforms can effectively enhance learning experiences and outcomes.

The success of Project U provides valuable insights for educators looking to implement digital interventions in their teaching. Future recommendations include expanding digital integration to create dynamic educational environments, fostering collaborative learning through peer interactions, and enhancing real-world connections by integrating mathematical concepts into real-world applications. In conclusion, Project U exemplifies the potential of digital tools to transform education, offering a blueprint for developing effective interventions that enhance student engagement, comprehension, and academic performance.

**Process**

Recognizing the challenges faced by Grade 7 students in understanding mathematical concepts, the researcher developed "Project U (Union of Minds)," an innovative Facebook Group designed as a dynamic and interactive learning platform. This initiative aimed to address the gaps identified in the students' initial performance and facilitate continuous learning through an engaging digital environment. The platform was meticulously planned to reinforce mathematical concepts, enhance student engagement, and foster critical thinking skills.

The analysis of the pre-test data revealed specific areas of difficulty for students, particularly in abstract reasoning and problem-solving. The researcher used these insights to define the objectives of Project U, focusing on creating a learning environment that would address these challenges. By selecting a Facebook Group as the platform, the researcher capitalized on its accessibility and the familiarity it holds among students, which was expected to encourage participation and engagement.

The design of Project U involved creating a private Facebook Group that served as a centralized hub for learning. This digital learning environment was designed to support both synchronous and asynchronous learning, allowing students to engage with the material at their own pace. The platform facilitated interaction among students and instructors, fostering a collaborative learning community.

**Conceptualization**. Faced with significant challenges in student engagement and comprehension of mathematical concepts, the need for an innovative educational solution became apparent. The pre-test results underscored substantial gaps in Grade 7 students' understanding, particularly in abstract reasoning and complex problem-solving. Traditional instructional methods were found lacking in addressing the diverse learning needs, necessitating a strategic intervention that could cater to various learning styles and preferences. The conceptualization considered:

**Interactive Learning Platform.** In response to these challenges, the researcher conceptualized and developed "Project U (Union of Minds)," an initiative leveraging the digital capabilities of social media to create an interactive learning platform. The idea was to harness the familiarity and accessibility of Facebook to engage students in a dynamic educational experience.


PROJECT U (UNION OF MINDS) >

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Project U was established as a private Facebook Group, providing a centralized hub for learning. This platform was meticulously designed to offer both synchronous and asynchronous learning opportunities, allowing students to engage with the material at their own pace. The group served as a repository of comprehensive learning materials, including lesson plans, instructional videos, and interactive activities tailored to support diverse learning preferences.

**Supporting Diverse Learning Styles.** The platform's design was intentional in accommodating various learning styles. Through multimedia content and real-world applications, Project U aimed to make mathematical concepts more relatable and easier to understand. By encouraging both independent and collaborative learning, the platform fostered an environment where students could explore concepts in ways that aligned with their personal learning preferences.

Project U emphasized interaction and engagement as core components of its educational strategy. Students were encouraged to participate in discussions, pose questions, and collaborate with peers, creating a community-driven learning atmosphere. This approach not only promoted active participation but also helped students develop critical thinking and problem-solving skills through collective inquiry and dialogue.

The development of Project U was firmly grounded in established educational theories. Vygotsky's Social Constructivism informed the collaborative aspect of the platform, emphasizing the importance of social interactions in knowledge construction. Kearsley and Shneiderman's Engagement Theory was reflected in the project's use of gamification and real-world applications to actively involve students in learning. Siemens' Connectivism highlighted the role of digital networks, with Project U leveraging technology to create a flexible and adaptive learning environment.

The conceptualization and implementation of Project U demonstrate the transformative potential of digital interventions in education. By addressing the specific challenges identified in the pre-test analysis, Project U effectively enhanced student engagement and mathematical proficiency. This initiative serves as a model for future educational strategies, illustrating how digital platforms can complement traditional teaching methods and offer enriched learning experiences. Through thoughtful integration of technology, social interaction, and collaborative learning, Project U paves the way for innovative educational practices that significantly improve student outcomes.

This intervention was meticulously planned to address gaps identified in students' initial performance and to facilitate continuous learning in an engaging digital environment. The development of Project U involved the following key steps:

**Planning.** The development of Project U was rooted in a strategic planning process aimed at addressing the educational challenges highlighted by the pre-test difficulty analysis. This analysis revealed significant gaps in Grade 7 students' understanding of mathematical concepts, particularly those that involved abstract reasoning and complex problem-solving. Recognizing these challenges, the researcher set out to define clear objectives for Project U, focusing on key areas that would enhance the learning experience and improve educational outcomes. The planning included:

**Defining Objectives.** The primary objectives of Project U were meticulously crafted to address the specific needs identified in the pre-test analysis. First, the project aimed to reinforce mathematical concepts by providing students with engaging and accessible learning materials. This involved the integration of instructional videos, comprehensive notes, and visual aids designed to cater to diverse learning styles. By focusing on reinforcing these concepts, Project U sought to bridge the gaps in students' comprehension and enable them to build a solid foundation in mathematics.

In addition to reinforcing mathematical concepts, the project aimed to enhance student engagement. The pre-test results indicated that traditional instructional methods were not sufficiently engaging for students, highlighting the need for a more interactive and dynamic learning environment. Project U addressed this need by fostering a community-driven learning atmosphere through the use of discussion prompts, question-and-

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answer sessions, and collaborative activities. These interactive features were designed to encourage active participation and motivate students to take an active role in their learning journey.

Furthermore, the project aimed to foster critical thinking skills among students. By encouraging students to apply mathematical concepts to real-world scenarios and engage in problem-solving activities, Project U sought to develop students' analytical skills and promote a deeper understanding of mathematics. The project emphasized the importance of critical thinking as a vital component of effective learning, empowering students to approach mathematical problems with confidence and creativity.

**Choosing a Platform.** The decision to utilize a Facebook Group as the platform for Project U was a deliberate choice based on its accessibility and familiarity among students. Facebook is a social media platform widely used by students, making it an ideal choice for creating a dynamic and engaging learning environment. The researcher recognized that leveraging a platform that students were already familiar with would encourage participation and make the transition to a digital learning environment seamless.

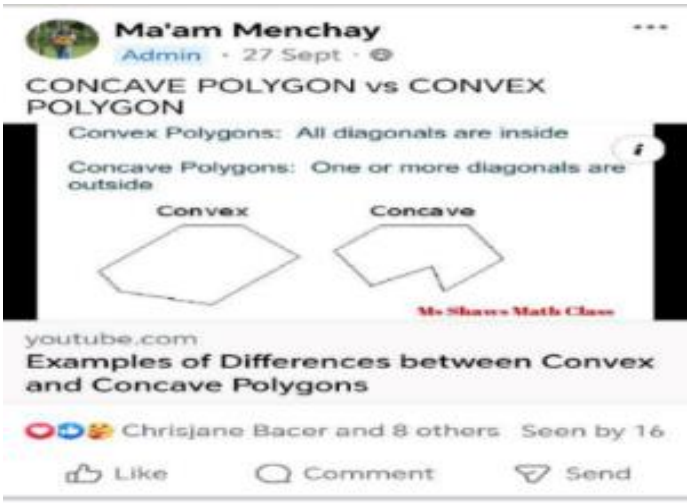
The use of a Facebook Group also allowed for both synchronous and asynchronous learning opportunities, giving students the flexibility to engage with the material at their own pace. This adaptability was crucial in accommodating diverse learning preferences and ensuring that all students could benefit from the resources provided. By capitalizing on the interactive nature of social media, Project U aimed to create a collaborative learning community where students could share ideas, ask questions, and support one another in their educational pursuits.

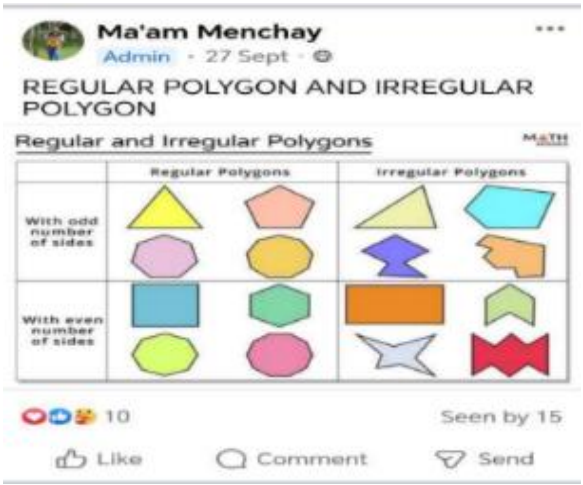
In conclusion, the planning process for Project U was guided by a thorough analysis of students' educational needs and a commitment to creating a supportive and engaging learning environment. By defining clear objectives and choosing an accessible platform, the project set the stage for a transformative educational experience that would enhance students' understanding of mathematics and prepare them for future academic success.

**Content Development and Curation.** The researcher meticulously curated diverse content types for Project U (Union of Minds) to align with the Grade 7 mathematics curriculum and address pre-test learning needs, providing structured resources tailored to various learning styles to enhance comprehension, retention, and application of mathematical concepts. The key instructional content included:

**Multimedia Lessons.** These lessons combined text, images, and interactive components to explain core mathematical ideas in a more engaging format. For example,

a lesson on “Classifying Polygons” used interactive slides and colorful diagrams to compare regular and irregular polygons and distinguish between convex and non-convex figures.



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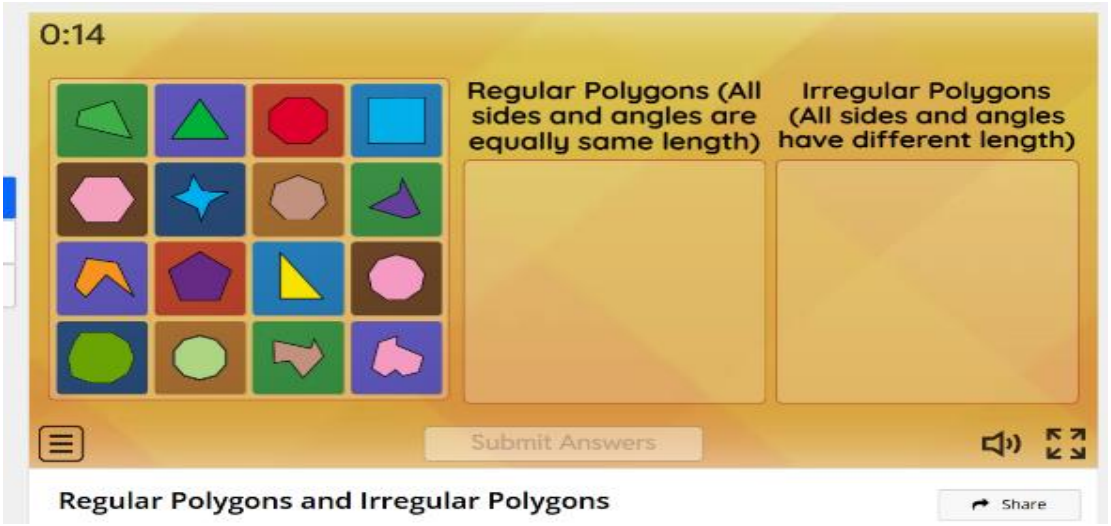
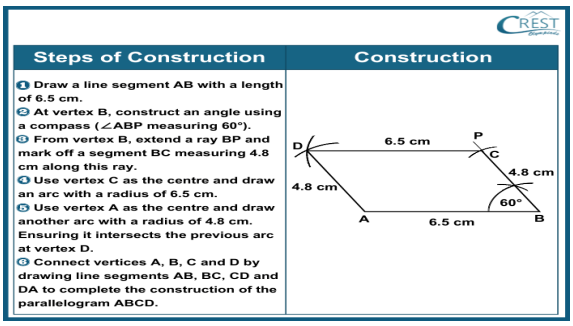
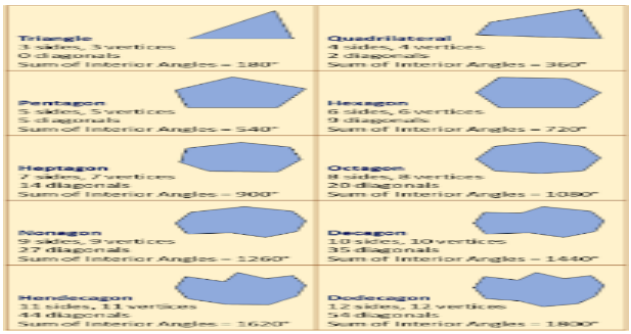
This format allowed students to manipulate images or explore content at their own pace, thereby improving their conceptual understanding.




**Visual Aids.** Visual representations were used extensively to support abstract mathematical concepts. For instance, diagrams of angles formed by intersecting lines and step-by-step constructions of triangles and quadrilaterals helped learners better understand geometric relationships. Visual aids also included charts showing types of polygons and tables summarizing properties (e.g., number of sides, angle sums), which served as quick-reference guides for learners during tasks.




**Instructional Videos.** These short teacher-created or curated videos provided narrated walkthroughs of mathematical procedures. For example, a video on solving percentage problems involving discounts and interest guided students through word problems with real-life applications, such as computing sale prices and calculating interest for savings. The audio-visual format helped auditory learners and supported asynchronous review for students who needed more time to absorb content



**Real-World Applications.** To promote relevance, the content included scenarios that applied mathematical concepts to real-life situations. An example involved designing a budget plan for a day, where learners calculated personal budget according to their goal, role, audience, situation, and performance or product.

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I. **Activity No. 8:** Money Talks (20 minutes)
II. **Objectives:** Create a budget plan for a day
III. **Materials Needed:** Pen and paper
IV. **Instructions:** Read and solve each word problems involving percentage related to simple interest rate.

| GRASP– PERSONAL BUDGET | |
|---|---|
| **Goal** | Design a personal budget that reflects your income |
| **Role** | Imagine you have an allowance that earns ₱150/week. You have saved all the money you earned over the 8 weeks of the first quarter of this school year. You have also had the opportunity to make more money when you help doing the chores at home. As a reward, you are given a total of ₱1300. |
| **Audience** | The Bank of _____ (fill in your name, or school name) |
| **Situation** | Create a budget for yourself that shows how much you have earned, how you have earned it, how much you plan to save, and how much you plan to spend, as well as itemizing what you plan to spend your money on. |
| **Performance or Product** | Your budget should then include all the necessary work involved in your calculations, as well as itemized lists of what you will be spending your money on, so as to reflect your personal choices. Record your income and expenses as positive and negative integers, respectively. Present these using a table or pie chart.<br><br>You will also need to decide whether or not you have any money left over at the end of your budget, to add to your savings, or if you are going to spend it all.<br><br>After completing your budget, complete a personal reflection piece that discusses how you made the choices you did, with regards to how much, and where you donated money to, and what you chose to purchase. |

These curated resources not only addressed different learning modalities but also aimed to foster critical thinking and engagement. The variety of content formats ensured that students had multiple entry points to grasp complex ideas, supported by visuals, narration, and contextual applications. This approach reflected the principles of differentiated instruction and digital pedagogy, tailored to meet the diverse academic profiles of the learners. Each post was crafted to make the learning material accessible and relatable, facilitating more profound understanding and retention.

The implementation of Project U had a significant impact on students' mathematical abilities. The platform's interactive nature and the use of multimedia content, such as instructional videos and visual aids, helped bridge the gap between theoretical concepts and practical understanding. By providing real-world applications of mathematical concepts, Project U made learning more relatable and engaging for students.

Post-test results demonstrated a marked improvement in students' scores, indicating that the intervention was effective in enhancing their comprehension and application of mathematical concepts. The personalized learning experience allowed students to interact with the material in ways that suited their individual learning preferences, leading to better academic outcomes.

Project U's success is deeply rooted in several key educational theories. Vygotsky's Social Constructivism highlights the significance of social interactions for constructing knowledge, which is mirrored in Project U's collaborative platform that fosters engagement among peers and instructors. This aligns with Kearsley and Shneiderman's Engagement Theory, which posits that learning is most effective when it is collaborative and project-based; Project U incorporates gamification and real-world applications to enhance student motivation and learning efficacy. Siemens' Connectivism further underscores the importance of digital networks, with Project U leveraging a digital platform to create a dynamic and adaptable learning environment, thus broadening access to information and fostering a flexible education experience. Overall, Project U exemplifies the transformative potential of digital interventions by integrating social interaction, collaborative learning, and digital networks, offering valuable insights and a model for improving educational outcomes in modern contexts.

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**Output**

Project U (Union of Minds) is meticulously crafted to enhance the learning experience of Grade 7 students by incorporating a variety of interactive features. These features are designed to make learning both accessible and engaging, catering to diverse learning preferences. The platform offers a structured approach, enabling students to view and review instructional videos, access comprehensive notes, and utilize visual aids that reinforce mathematical concepts. Such resources are tailored to cater to different learning styles, providing students with real-time feedback and support.

Project U is designed with an array of interactive features to make learning accessible and engaging. The group allows students to view and review instructional videos, access comprehensive notes, and use visual aids tailored to reinforce mathematical concepts. This structured approach will enable students to benefit from real-time feedback and resources that support different learning preferences.

**Interactive Features and Student Engagement.** The interactive features of Project U were vital in fostering active student participation and engagement. By integrating discussion prompts, question-and-answer sessions, and collaborative activities, the platform encouraged students to engage in meaningful exchanges. These interactions involved students commenting on posts, sharing their solutions, and asking questions, creating a dynamic and inclusive learning environment. The following strategies were considered:

**Analysis of Engagement Strategies**. An analysis of Project U's interactive features reveals their centrality to the platform's success in promoting engagement. By prompting students to actively participate, the platform cultivated a community-driven learning model that balanced teacher-student and peer-to-peer interactions. This holistic approach supported diverse learning needs, ensuring that every student could benefit from the interactive elements. The real-time nature of the activities provided immediate feedback, fostering a continuous learning and collaborative environment. This immediacy not only kept students engaged but also reinforced their understanding through timely clarification and guidance.

**Enhancing Learning through Active Participation**. The success of these interactive features suggests that engaging students in active participation can significantly enhance their learning experience. By encouraging students to take an active role in their education, Project U empowered them to become more invested in their learning journey. This involvement likely contributed to improved comprehension and retention of mathematical concepts, as students were able to apply critical thinking and problem-solving skills in a supportive community setting. The active engagement allowed students to experience a more personalized and impactful learning process, where they could explore concepts at their own pace and according to their individual learning preferences.

This approach aligns with educational theories and studies that emphasize the importance of interaction and collaboration in learning. Research conducted by Green et al. (2020) in the Lecture Notes in Social Networks series highlights the potential of social media to create dynamic and interactive learning environments, akin to Project U’s implementation. Their findings underscore the idea that using familiar digital platforms can enhance educational engagement and outcomes. Additionally, Kearsley and Shneiderman's Engagement Theory supports the premise that project-based and collaborative learning can enhance student motivation and efficacy. By leveraging these interactive features, Project U demonstrated the transformative potential of digital platforms in modern education, offering valuable insights into improving student engagement and learning outcomes. This demonstrates how carefully designed digital interventions can effectively complement traditional educational methods, providing enriched learning experiences that cater to the diverse needs of students.

**Real-Time Updates and Support.** The real-time updates and support feature of Project U played a pivotal role in maintaining student engagement and ensuring they had immediate access to new learning materials. This capability allowed students to receive timely feedback on their contributions, which kept them actively engaged and on track with the curriculum outside the traditional classroom setting. By providing continuous access to fresh content and feedback, the platform fostered a dynamic learning environment that encouraged consistent participation and learning. The following are considered:

**Immediate Feedback and Student Motivation**. Analyzing this feature reveals its centrality to the platform's success in facilitating ongoing student engagement. The immediacy of updates and feedback provided students with a steady stream of information and guidance, enabling them to stay abreast of the curriculum's demands. This direct and prompt communication allowed students to address any learning gaps swiftly, reinforcing their understanding and application of mathematical concepts without the delays typical in traditional educational settings.

The success of real-time updates and support suggests that when students are provided with immediate feedback and resources, they are more likely to engage deeply with the material. The prompt nature of these interactions likely enhanced students' confidence and motivation, as they could quickly rectify misunderstandings and build upon their knowledge. This approach supports the idea that timely feedback is a crucial component of effective learning, as it helps students integrate new information seamlessly into their existing cognitive frameworks.

This feature aligns with research emphasizing the impact of timely feedback on learning outcomes. Studies, such as those by Green et al. (2020) in the Lecture Notes in Social Networks series, underscore the potential of digital platforms to provide immediate feedback and resources, enhancing student engagement and learning efficacy. Additionally, these findings resonate with Kearsley and Shneiderman's Engagement Theory, which suggests that real-time interactions in project-based learning environments can significantly boost student motivation and achievement. By incorporating real-time updates and support, Project U exemplifies the transformative potential of digital interventions in modern education, offering a model for creating responsive and engaging learning experiences.


**Monitoring and Feedback Mechanism.** The monitoring and feedback mechanism in Project U is a cornerstone of its success, actively involving the researcher in overseeing group activities and discussions. This continuous engagement ensures that students receive timely feedback, which is crucial in motivating them to reflect on their learning processes. The researcher's involvement encourages students to apply critical thinking and develop analytical skills, particularly in solving mathematical problems, thus fostering a rich learning environment. The following were considered:

**Active Involvement of the Researcher**. The active monitoring and feedback provided by the researcher help maintain a dynamic learning environment that is responsive to students' needs. By facilitating discussions and providing real-time feedback, the researcher creates a community-driven learning atmosphere where students feel supported and encouraged to engage deeply with the material. This approach not only aids in clarifying misunderstandings but also supports the development of higher-order thinking skills, such as analysis and synthesis.

**Impact on Student Engagement and Learning Outcomes**. From this, we can infer that the active involvement of educators in monitoring and providing feedback is essential in enhancing student engagement and learning outcomes. The real-time nature of feedback and support likely increases student confidence and motivation, enabling them to integrate new knowledge effectively. This method supports the idea that continuous, interactive feedback is a key component of effective education, promoting sustained student interest and achievement in complex subjects like mathematics.

**Educational Benefits of Real-Time Feedback**. The importance of monitoring and feedback aligns with educational research that emphasizes the impact of active engagement and real-time feedback on learning outcomes. Studies such as those by Green et al. (2020) highlight the transformative potential of digital platforms in creating interactive learning environments that provide immediate feedback, enhancing student engagement and efficacy. Additionally, this approach resonates with Kearsley and Shneiderman's Engagement Theory, which suggests that active participation and real-time feedback in learning environments significantly boost student motivation and achievement. Project U exemplifies these principles by integrating continuous monitoring and feedback to create a responsive and engaging educational experience.

**Effectiveness of Project U**

**Post-test Results.** After completing the intervention through Project U (Union of Minds), students took a post-test identical to the pre-test to assess improvements in their mathematical skills. The post-test results provided a precise measure of the effectiveness of the digital platform in addressing the areas identified as challenging. Statistical analysis showed a significant increase in scores, demonstrating that Project U positively impacted students' understanding and application of mathematical concepts.

The post-test findings highlighted a substantial improvement across various skill levels, confirming that the interactive, collaborative features of Project U effectively supported student learning. By actively engaging in discussions, accessing resources, and practicing problem-solving, students achieved higher test scores and showed greater confidence and interest in the subject. These results underscore the potential of structured digital learning platforms like Project U to enhance academic performance in mathematics.

**t-test Result.** A paired t-test was conducted to compare the pre-test and post-test results, yielding a t-value of -14.957 and a p-value of $<0.001$, indicating a very highly significant difference between the scores. Furthermore, Cohen's d was calculated at 2.73,

indicating a large effect size and affirming the considerable impact of the Project U intervention as shown in table 5.

The significant increase from the pre-test to post-test scores indicates that Project U strongly impacted students' mathematical skills. The enormous effect size of 2.73 suggests that the change was statistically significant and practically meaningful, underscoring the platform's effectiveness in facilitating improved student understanding and skills.

This result aligns with findings from Chugh (2018), who noted that social media platforms, like Facebook, significantly enhance academic achievement and student engagement. Chugh's study highlighted how social media facilitates collaborative learning and provides an interactive space for student-teacher communication, information sharing, and engagement—all elements critical to the observed improvement in student performance in this study.

The positive shift in student scores demonstrates the effectiveness of Project U asan intervention, fostering higher engagement and the ability to apply mathematical concepts with more excellent proficiency. The collaborative features of the platform allowed students to clarify doubts, share solutions, and reinforce learning through peer interactions, which likely contributed to their improved performance.

Educational institutions should adopt social media-based learning platforms like Project U to promote interactive and collaborative learning in subjects such as mathematics. Integrating these tools can enhance

student engagement, provide timely feedback, and support concept retention, all essential for improving academic outcomes.

Some of the highest mean scores were recorded for "Complete the tasks assigned through the Project U (Union of Minds) on time" (mean = 3.63, Highly Engaged) and "Find the Project U (Union of Minds) activities engaging and interesting" (mean = 3.60, Highly Engaged). Other items such as "Regularly check the Project U (Union of Minds) for new learning materials" and "Contribute my own ideas and thoughts during discussions in the Project U (Union of Minds)" also reflect consistent engagement from the students.

The results indicate that students generally find Project U (Union of Minds) an effective platform for fostering engagement. Most of the students are engaged with the materials and interactions within the group, as shown by the mean scores, with task completion and interaction with classmates through comments scoring exceptionally high. This implies that Project U (Union of Minds) plays a significant role in keeping students engaged with their tasks and assignments and those students feel motivated to interact with the material and their peers.

These findings align with Green et al. (2020), who found that integration of social media provides a platform for peer support and communication that can significantly improve student engagement and motivation. The University of Wollongong study indicated that social media helps create an engaging learning environment that enhances academic performance, echoing the engagement levels demonstrated by the students in this study.

Table 5

*Comparison of Pre-Test and Post-Test Results of the Grade 7 Students*

| | | | Paired t-test | | | Effect Size | |
|---|---|---|---|---|---|---|---|
| | M | SD | t-value | p-value | Interpretation | Cohen's d | Interpretation |
| Pre-test | 12.8 | 3.82 | -14.957 | <0.001 | Very Highly Significant | 2.73 | Large Effect |
| Post-test | 25.0 | 6.09 | | | | | |

Legend:

| p-values | Interpretation | Cohen's d | Effect Size Interpretation |
|---|---|---|---|
| $p < 0.001$ | very highly significant | 2.73 | large effect |
| $p < 0.01$ | highly significant | 0.21 - 0.79 | medium effect |
| $0.01 < p < 0.05$ | significant | 0.80 or higher | large effect |
| $p \geq 0.05$ | not significant | 0.00 - 0.20 | small effect |

**Table 6**

*Students' Engagement in Project U (Union of Minds) as A Learning Platform in Mathematics Class*

| Indicator | Mean | Verbal Interpretation (VI) |
|---|---|---|
| 1. Actively participate in discussions within the Project U (Union of Minds). | 3.37 | ME |
| 2. Regularly check the Project U (Union of Minds) for new learning materials or activities. | 3.47 | ME |
| 3. Feel motivated to complete the tasks and assignments posted in the Project U (Union of Minds). | 3.47 | ME |
| 4. Frequently interact with my classmates through comments and messages in the Project U (Union of Minds). | 3.57 | HE |
| 5. Find the Project U (Union of Minds) activities engaging and interesting. | 3.60 | HE |
| 6. Ask questions or seek clarification in the Project U (Union of Minds) when I don't understand something. | 3.43 | ME |
| 7. Contribute my own ideas and thoughts during discussions in the Project U (Union of Minds). | 3.47 | ME |
| 8. Use the resources and links provided in the Project U (Union of Minds) to help me understand the lessons better. | 3.40 | ME |
| 9. Feel more involved in the learning process because of the activities in the Project U (Union of Minds). | 3.47 | ME |
| 10. Complete the tasks assigned through the Project U (Union of Minds) on time. | 3.63 | HE |
| **Overall** | **3.49** | **ME** |

**Legend:**
1.00 – 1.49 Not Engaged (NE);
1.50 – 2.49 Slightly Engaged (SE);
2.50 – 3.49 Moderately Engaged (ME);
3.50 – 4.00 Highly Engaged (HE)

**Engagement of Students.** The data presented in the table illustrates the level of student engagement in Project U (Union of Minds), a Facebook-based learning platform, in the context of mathematics class. Based on ten indicators shown in table 7, the results show a total mean of 3.49, which falls under the category of "Moderately Engaged." The highest-rated indicators include completing assigned tasks on time (M=3.63), finding activities engaging and interesting (M=3.60), and frequently interacting with classmates (M=3.57), all interpreted as "Highly Engaged." On the other hand, the lowest mean scores were observed in using the provided resources and links to understand the lessons (M=3.40) and seeking clarification when something is not understood (M=3.43), though still within the "Moderately Engaged" range. These results suggest that while students are generally engaged, they respond more positively to collaborative and activity-based tasks compared to self-initiated learning efforts like asking questions or utilizing learning materials independently. These findings align with previous studies, such as Junco (2012), which demonstrated that Facebook can enhance student engagement when used for academic interaction, and Madge et al. (2009), who found that students value social media platforms for peer communication and academic task management. Given this, it is recommended that teachers increase guidance in using online resources, create structured opportunities for question-and-answer interactions, and continue promoting collaborative activities that students find

motivating. Additionally, incorporating motivational strategies such as recognition for timely task completion could further enhance student participation and engagement.

Project U (Union of Minds) is a strategic intervention that bridges the gap between classroom and digital learning, addressing the specific challenges identified in the pre-test results. By utilizing Facebook as a familiar platform, the project fosters an interactive, supportive, and accessible environment for Grade 7 students, promoting continuous engagement and enhancing both critical thinking and mathematical skills.

### Teacher's Perception on Engagement

Students generally reported being moderately engaged (ME) in the activities of Project U (Union of Minds), with an overall average of 3.49 as shown in table 8. They highlighted their active participation in discussions, consistent review of learning materials, timely task completion, and frequent peer interactions, showcasing the platform's effectiveness as a learning resource. In addition to the students' engagement reports, teachers noted similar levels of involvement, pointing out that students exhibited enthusiasm and actively participated during class discussions and activities facilitated by the platform. The teacher also observed improvements in collaborative learning behaviors and a greater willingness among students to seek clarifications and share ideas, which aligns with the student's feedback.

**Table 7**

*Students' Engagement in Project U (Union of Minds) as A Learning Platform In Mathematics Class Perceived by the Teacher*

| Indicator | Mean | Verbal Interpretation (VI) |
|---|---|---|
| 1. The learner actively participate in discussions within the Project U (Union of Minds). | 3.54 | HE |
| 2. The learner regularly check the Project U (Union of Minds) for new learning materials or activities. | 3.59 | HE |
| 3. The learner feel motivated to complete the tasks and assignments posted in the Project U (Union of Minds). | 3.40 | ME |
| 4. The learner frequently interact with my classmates through comments and messages in the Project U (Union of Minds). | 3.58 | HE |
| 5. The learner find the Project U (Union of Minds) activities engaging and interesting. | 3.60 | HE |
| 6. The learner ask questions or seek clarification in the Project U (Union of Minds) when I don't understand something. | 3.34 | ME |
| 7. The learner contribute his/her own ideas and thoughts during discussions in the Project U (Union of Minds). | 3.46 | ME |
| 8. The learner use the resources and links provided in the Project U (Union of Minds) to help me understand the lessons better. | 3.40 | ME |
| 9. The learner feel more involved in the learning process because of the activities in the Project U (Union of Minds). | 3.37 | ME |
| 10. The learner complete the tasks assigned through the Project U (Union of Minds) on time. | 3.63 | HE |
| **Overall** | **3.49** | **ME** |

**Legend:**
1.00 – 1.49 Not Engaged (NE);
1.50 – 2.49 Slightly Engaged (SE);
2.50 – 3.49 Moderately Engaged (ME);
3.50 – 4.00 Highly Engaged (HE)

## CONCLUSIONS

The study concluded that baseline mathematical skills among Grade 7 students showed considerable room for improvement, particularly in areas where students exhibited lower comprehension. The difficulty index results underscored the necessity of adopting a structured intervention to effectively address these gaps.

The findings demonstrate that Project U (Union of Minds) is a valuable tool for fostering student engagement and improving mathematical skills in a supportive digital environment. By leveraging familiar social media tools, the platform addressed gaps in comprehension and motivated students to engage more deeply with mathematical concepts.

The study finds that Project U (Union of Minds) effectively enhances mathematical skills and engagement in Grade 7 students through collaborative, interactive learning. Significant improvements in post-test performance highlight its ability to facilitate academic growth. By using a social media-based platform, it bridges understanding gaps and fosters critical thinking, complementing traditional teaching. Positive student feedback suggests it extends classroom instruction and strengthens problem-solving skills. The sense of

community and real-time support encourages active participation and collaboration, making it a valuable educational strategy.

## RECOMMENDATIONS

To further address learning challenges, it is recommended that educators and schools integrate digital tools like Project U to support students' engagement and learning. Such platforms should include additional visual aids, guided examples, and collaborative exercises to enhance comprehension. Incorporating regular formative assessments within Project U can help track student progress and adjust content to address specific needs, ensuring sustained improvement in mathematical skills. Additionally, teacher training on the effective use of interactive platforms could optimize their impact, contributing to better academic outcomes and a supportive learning environment.

To enhance the effectiveness of Project U (Union of Minds), it is recommended that additional interactive elements such as peer reviews, collaborative group tasks, and more frequent opportunities for real-time feedback be incorporated. Educators should consider expanding the use of digital platforms like this to maintain engagement and support continuous learning.

It is recommended that educators and institutions integrate social media-based platforms like Project U to facilitate interactive learning, particularly in subjects that benefit from collaborative problem-solving. The consistent engagement and real-time support offered by such platforms can help address diverse learning needs. Future studies could explore the impact of similar digital interventions across different subjects and grade levels. The inclusion of periodic assessments within these platforms may further enhance learning outcomes by enabling timely feedback and targeted support for students struggling with specific concepts. Training for teachers on digital platform management can further optimize student interaction, ensuring sustained engagement and skill development in mathematics and other subjects. Additionally, periodic assessments should be implemented to track progress and adapt the content based on areas where students may require additional support.

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