



OPTIMIZING LEARNING COMPETENCIES IN TEACHING MAPEH THROUGH GAME- BASED LEARNING APPROACH

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Abstract :

This study was conducted to determine the effectiveness of “Game-Based Learning” as an intervention in improving the MAPEH skills of Grade 6 students in Parian Elementary School, Mangatarem II District, Schools Division Office I Pangasinan School Year 2023 – 2024. Specifically, this study answered the following: 1. The age and gender profile of the Grade 6 learner-respondents ; 2. the level of academic performance in MAPEH of the Grade 6 learner-respondents ; 3. the level of academic performance in MAPEH of the Grade 6 learner-respondents after integrating Game-Based Learning as an intervention; 4. the significant difference between the academic performance in MAPEH of the Grade 6 learner-respondents after intervention integration.

Based on the findings of this study, several key conclusions have been drawn. First, the immersive application of games in lessons has been found to be highly motivating for students. The interactive and engaging nature of game-based learning encourages learners to actively participate in lessons, making the educational experience more enjoyable and stimulating. This suggests that integrating game elements into instruction can significantly enhance student motivation and engagement in learning.

Second, an effective educational game should incorporate key elements such as challenge, curiosity, and fantasy. Games like Dimension M, which are structured into a series of missions, provide a sense of challenge that motivates students to persevere in their learning tasks. The inclusion of role-playing activities meets the criteria for fantasy, allowing students to immerse themselves in a learning experience that is both engaging and educational. Furthermore, the way games are organized into various missions fosters curiosity among learners, encouraging them to explore and discover new concepts. While games can be used as supplementary learning tools, research has shown that their integration into the core curriculum can have a significant impact on student learning outcomes.

Third, teachers should be open and willing to incorporate more technology into their classrooms, particularly tools and strategies that have been proven to enhance student motivation and academic achievement. The integration of game-based learning can help bridge the gap between traditional instructional methods and modern approaches that cater to the digital generation. By embracing technology, educators can create more dynamic and interactive learning environments that support student growth and development.

Additionally, game-based learning provides students with a preferred learning environment that is different from the traditional classroom setting. Unlike conventional teaching methods, which are often teacher-centered, game-based learning places students at the forefront of their education. This approach allows learners to develop essential skills such as problem-solving, critical thinking, collaboration, and adaptability—competencies that are highly valued in the 21st-century workforce.

Moreover, the teaching styles and approaches used by educators should evolve over time to meet the changing needs of students. engaging students in mastering subjects like MAPEH. By incorporating innovative teaching strategies, educators can foster a more student-centered learning experience that enhances comprehension and skill development.

Finally, game-based learning has been proven to be an effective instructional method. When implemented correctly, it not only increases student motivation but also improves learning outcomes by making lessons more engaging and interactive. This suggests that game-based learning should be embraced as a valuable educational tool to enhance students' academic performance and overall learning experience.

Based from the conclusions, the following are hereby recommended: To ensure the successful integration of game-based learning in MAPEH instruction, several recommendations are proposed. First, strategic teaching approaches must be employed to develop students' interest and encourage their engagement in learning. Teachers should adopt instructional strategies that make lessons more interactive, engaging, and relevant to students' experiences. By fostering an environment that promotes active participation, students are more likely to develop a genuine interest in their studies.

Second, educators should be willing to incorporate game-based learning techniques to reinforce and consolidate lessons. Games can be used not only in the classroom but also as part of homework or independent study activities. By providing students with opportunities to engage with educational games outside of school hours, teachers can further enhance student learning and retention of key concepts.

Lastly, innovative learning approaches such as game-based learning should be widely adopted to address both academic and non-academic skills necessary for student success. In addition to improving academic performance, game-based learning helps students develop essential life skills such as collaboration, decision-making, and perseverance. By integrating game-based strategies into teaching, educators can create a more holistic and effective learning experience that prepares students for future challenges in both their academic and personal lives.

By considering these recommendations, schools and educators can harness the full potential of game-based learning to optimize the teaching and learning of MAPEH, ultimately improving student motivation, engagement, and competency in the subject.

INTRODUCTION

The primary goal of education is to equip students for lifelong learning (Divjak & Tomic, 2005). As digital technology becomes increasingly integrated into various aspects of life, its incorporation into education has become essential. A growing number of classrooms now utilize technology to enhance learning experiences (Rosen & Beck-Hill, 2002). The use of technology in education aims to create engaging environments that facilitate students' understanding and retention of curriculum content (Rosen & Beck-Hill, 2002). Moreover, technology enables teachers to differentiate instruction according to the diverse needs of learners. Differentiation involves providing students with multiple pathways to acquiring knowledge, processing information, and constructing meaningful learning experiences.

Although technology offers vast resources for educational reform, many educators tend to use it only to support traditional teaching methods rather than instigating a transformative shift in pedagogy (Rosen & Beck-Hill, 2002). The integration of technological tools such as tablets in the classroom enhances the learning process by engaging multiple senses, such as auditory and visual, which research has shown to be particularly beneficial in MAPEH (Carr, 2002). These tools promote student-centered learning environments (Carr, 2002).

Over the past four decades, research has highlighted the effectiveness of game-based learning (GBL) in improving student engagement while reducing the time required for traditional instruction (Divjak & Tomic, 2005). Games provide an interactive and dynamic learning environment that aligns with students' preferences and fosters deeper understanding compared to conventional classroom settings (Kebritchi, Hirumi & Bai, 2010). According to Spires (2003), digital games require players to master essential 21st-century skills such as strategic thinking, problem-solving, decision-making, and adaptability, making them a valuable tool for modern education.

Furthermore, student engagement in the learning process is closely linked to the relationship they have with their instructors (Rosen & Beck-Hill, 2012). The role of educators has evolved significantly with the integration of technology. Tapscott (1997) emphasized that teachers now act more as facilitators of social learning, allowing students to construct their own knowledge (p. 148). Game-based learning provides an ideal platform where students take the lead in their learning process while teachers serve as guides and motivators.

The application of game-based learning has demonstrated numerous benefits in enhancing the quality of teaching and learning, particularly in MAPEH. GBL encourages students to engage in problem-solving and self-directed learning, enabling them to grasp MAPEH concepts seamlessly. Studies indicate that GBL fosters motivation and engagement by incorporating elements of challenge, curiosity, and creativity into learning. Additionally, GBL helps build students' confidence, enhances their interest in MAPEH, and fosters an enjoyable learning experience.

Research suggests that student motivation is closely tied to self-efficacy, as learners who believe in their abilities tend to be more engaged and proactive in their learning journey. Given these findings, this study aims to explore the effectiveness of a game-based learning approach in enhancing MAPEH competencies among Grade 6 learners at Parian Elementary School in Mangatarem II District.

Studies indicate that incorporating games in teaching can improve student participation, support social and emotional development, and encourage risk-taking in learning. For example, research on the multiple-choice quiz game QuizUp found that it

positively influenced students' attitudes toward learning and improved academic performance. By integrating game-based learning, students can select from a variety of interactive materials that align with their interests and preferred learning styles.

Theoretical Framework

The existing literature on game-based learning within the K-12 education system is relatively limited. Many studies focus on older learners or emphasize other subject areas instead of MAPEH. However, valuable insights can still be drawn from studies on the implementation of GBL in different academic contexts.

A study by Kickmeier-Rust, Hillemann & Albert (2002) investigated Austrian seventh-grade students using an app called Sonic Divider, which incorporated gaming principles such as scoring systems and competitive play. The study found that students preferred using the app over traditional worksheet-based assessments. Boys, in particular, showed a stronger preference for competition and score comparison. However, the study did not assess the impact of the app on summative learning outcomes.

Carr (2002) examined how the use of tablets in American eighth-grade classrooms affected student achievement in MAPEH. The study did not find significant improvements in students' standardized test scores. Researchers suggested that this could be due to a disconnect between standardized test measures and the learning outcomes achieved through digital devices. The study also did not specify the types of game-based learning applications used.

Kebritchi et al. (2000) explored how computer games could enhance high school students' motivation and achievement in MAPEH. The study involved 100 students playing an educational game called Dimension M, which combined an immersive storyline with problem-solving missions. Students who participated in the game-based learning activities reported higher levels of motivation and demonstrated improved performance on standardized tests compared to their peers in the control group.

Bai et al. (2002) conducted a study on the impact of the same game on eighth-grade students in the United States. The researchers observed that students in the control group, who were not exposed to GBL, exhibited declining motivation as lessons became more challenging. In contrast, students using game-based learning maintained engagement and interest, suggesting that complex MAPEH concepts could be more effectively taught using interactive games.

Further research is necessary to explore additional educational games and alternative assessment methods beyond standardized tests. Additionally, studies examining game-based learning in non-Western educational settings remain scarce. Existing research on American classrooms has not fully addressed how GBL aligns with curriculum standards (Spires, 2003). Moreover, current studies largely focus on supplementing traditional teaching methods with games rather than entirely transforming instructional approaches through GBL.

RESEARCH QUESTIONS

This study aimed to determine the effectiveness of Game-Based Learning as an approach in improving the achievement of selected Grade 6 learners of Parian Elementary School in Mangatarem II District District, Schools Division Office I Pangasinan for School Year 2023-2024.

Specifically, the study required answers to the following specific problems;

1. What is the profile of the Grade 6 learner-respondents in terms of:
 - a.) age , and
 - b.) gender
2. What is the learning achievement of the Grade 6 learners in MAPEH of those identified schools in the pretest and posttest?
3. Is there a significant difference in the achievement of the Grade 6 learners in MAPEH of those identified schools in the pretest and posttest?

Null Hypothesis

There is no significant difference in the achievement of the Grade 6 learners MAPEH in pretest and posttest.

GENERATION OF ALTERNATIVE SOLUTIONS

By playing games, students become more motivated to learn, pay attention and participate in set tasks. Games help students to become a part of a team as well as take responsibility for their own learning.

In MAPEH learning, the application of game-based learning is seen to have many benefits helping to improve the quality of the teaching and learning process. Setting clear learning objectives in line with curriculum requirements with student-centered implementation has made game-based learning more effective (Farber, 2003; Tan, 2003). The application of game-based learning to the constructivism approach is able to form the basic systematic concepts and skills of students. This is because this kind of approach will encourage students to solve problems and self-learning and thus, enable students to learn a systematic concept without realizing it. As a result, students' self-esteem and self-efficacy can be improved and help improve student achievement in MAPEH.

Game-based learning will help improve student achievement in MAPEH because while playing, students will apply basic concepts and skills, reading skills, problem solving skills to ensure that assignments are successfully completed. However, there are some researchers who use gamification compared to the GBL approach. Although both incorporate a culture of innovation in teaching and make it more interactive (Rohaila & Fariza, 2007), gamification focuses more on the application of games that have design elements in non-game contexts (Cunha et al., 2001) where their role is more to support students' learning.

The game-based learning is an approach that emphasizes the application of games in helping to achieve learning objectives (Tao et al., 1999). Therefore, the main purpose of gamification is to motivate and stimulate student interest (Kiili et al., 2001) by making rewards as the key medium for encouraging students to play. This is in contrast to GBL's more focused approach to achieving learning objectives rather than in-game rewards. Therefore, the choice of the game-based learning approach is more appropriate to achieve the objectives of the study.

Game-based learning approach is a combination of four aspects namely curriculum knowledge practices, pedagogical knowledge practices, scenario-based knowledge practices and daily knowledge practices. Thus, this kind of approach will enable students to carry out their own learning in a free and safe learning environment. This allows students to learn freely without the fear of making mistakes as the GBL provides instant feedback.

Helpful Steps for Improving MAPEH Learning Skills :

A.) Student's Motivation in MAPEH

Motivation is the instinct or innate desire or ability in one's inner or outer self to do something. Motivation is defined as the cause, intensity, passion or interest that drives a particular behavior (Maslow, 1987). Motivation can also be understood as an affective and emotional stimulus that motivates one to achieve a set goal (Guthrie & Coddington, 1999). Self-motivation motivates the individual to do something to achieve enjoyment and to overcome challenges rather than external factors such as pressure or reward. This is due to the natural curiosity and desire to learn something new without any rewards. Motivation from within is known as intrinsic motivation that motivates a person to work with pleasure for the pleasure and satisfaction that come from their performance (Deci & Ryan, 1991).

Several previous studies have shown that student achievement is influenced by the level of student motivation (Leibham, 2005). This is because motivation plays an important role in student learning and achievement. Low levels of student motivation make students less interested in MAPEH learning. Losing interest in MAPEH is a hindrance for students to succeed. This creates a sense of discomfort in the learners that causes them to quickly become bored and difficult to understand what the teacher is teaching. This is because low levels of motivation affect learners' focus on learning and develop a lazy attitude toward students.

Low motivation also causes students not to try to solve the given problems by teachers and not interested in MAPEH. The process of learning MAPEH also only occurs in the classroom because students are not motivated and enjoy doing the MAPEH and doing the MAPEH exercises at home (Skaalvik et al., 2002). This results in students not mastering MAPEH well and resulting in low achievement. Therefore, the level of student motivation in learning needs to be taken into account by teachers. This is because recent studies have shown that low student motivation in learning influences student engagement in learning and affects student achievement in MAPEH.

The teaching approach of teachers should, therefore, be enhanced so as to attract students to learning and thus, increase student motivation towards MAPEH. Implementing an engaging and appropriate learning approach with students will create positive student needs and thus enhance student motivation to learn. The application of a learning approach such as game-based learning will encourage students to feel the need to complete the game activities implemented and thus, influence their motivation for the goals they want to achieve.

B. Game-Based Learning and Student Motivation

The review findings show that game-based learning helps teachers to motivate student engagement in MAPEH. This is because, this kind of approach is regarded as a potential means for improving students' confidence and increasing their motivation by incorporating challenge, curiosity and fantasy to a specific problem. Game-based learning as a tool for motivating students can be effective because it provides interesting activities for students that can build up their intrinsic motivation.

Students' intrinsic motivation is an important factor that influences student learning and achievement. Learning experiences and environment throughout the teaching and learning process can be motivating factors as the stimulus received by the students will motivate them to achieve the desired learning objectives. A good and effective teaching and learning process will be a key driver in keeping students engaged in the learning process.

Previous studies have shown that the application of game-based learning has helped to increase students' instructional motivation in MAPEH learning according to Beserra et al., 2003; Kiili et al., 2002; Wang et al., 2002). This is because technology-based approaches make the learning process more interactive and engaging. This is in line with the needs and learning needs of students of this age who are often exposed to sophisticated technology devices in everyday life.

RESEARCH METHODS

a. Participants and / or other Sources of Data and information

To make the study more feasible, it was important for the researcher to identify the group of learners to be part of the study. There were thirty (30) Grade 6 student-respondents of which Five (5) males and Five (5) females of Parian Elementary School, Mangatarem II District, Schools Division Office I Pangasinan. The researcher used purposeful sampling technique. This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest (Cresswell, 2000). In addition to knowledge and experience, Bernard and Spradley (2000) note the importance of availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner. In contrast, probabilistic or random sampling is used to ensure the generalizability of findings by minimizing the potential for bias in selection and to control for the potential influence of known and unknown confounders.

b. Data Gathering Methods

The technique used for collecting the data in this study was the pre and post-test whereby the learners' test results were studied. The researcher gave a pre-test to the learners from the Grade 6 classes at Parian Elementary School, Mangatarem II

District, Schools Division Office I Pangasinan. The purpose of giving the pre-test is to know the basic knowledge of the learners before the intervention. The researchers also gave a posttest to the Grade 6 learners. The purpose of giving the posttest is to know learners' understanding after the intervention was given. Analysis of the data was done after the learners had finished doing their pretest and posttest.

Data for this study were gathered through Descriptive Research. Descriptive research is defined as a research method that describes the characteristics of the population or phenomenon that is being studied. This methodology focuses more on the "what" of the research subject rather than the "why" of the research subject.

In other words, descriptive research primarily focuses on describing the nature of a demographic segment, without focusing on "why" a certain phenomenon occurs. Moreover, it "describes" the subject of the research, without covering "why" it happens.

Thus, the study focuses on describing the effectiveness of integrating an intervention called game-based learning to improve the level of academic performance of Grade 6 learners in MAPEH. Descriptive study is most appropriate.

A pretest was conducted to determine the level of academic performance of the Grade 6 learners. Then afterwards the Grade 6 learners were grouped into two with fifteen (15) members each. Group A was the experiment group wherein the Game-Based Learning was utilized, whereas Group B, the control group wherein no intervention was applied. A post test was conducted to gauge any improvement in their academic performance in MAPEH.

c. Data Analysis plan

The data gathered were tabulated, analyzed using the frequency, mean, percentage and t-test. Problem 1 was answered through getting the mean and percentage of achievement of the learners, Problem 2 was answered through the computation of the significant difference at 0.5 level of significance. For better and accurate computations of the data gathered, the use of Microsoft Excel Analysis Tool Pack was used.

DISCUSSION OF RESULTS AND REFLECTION

The academic performance in MAPEH of the Thirty (30) Grade 6 student-participants were recorded through a pretest reading activity wherein they were task to answer Fifteen (15) questions. The students were then designated to two groups, Group A for those who were under the Game-Based Learning intervention and Group B, those who were not treated with the Game-Based Learning intervention. Table 1 presents the profile of the learners according to age and gender.

Table 1. Profile of Participants (Age & Gender)

	<i>Frequency or Number</i>	<i>%</i>
Age		
12 years	2	7.00
13 years	25	83.00
14 years	3	10.00
TOTAL	30	100.00
Gender		
Male	12	40.00
Female	14	60.00
TOTAL	30	100.00

Table 2. Academic Performance of the Grade 6-participants (Pretest)

	Group A	Group B
Mean	6	4.6
Median	7	7
Mode	7	7

Table 3. Academic Performance of the Grade 6- participants (Post Test)

	Group A	Group B
Mean	20.8	8.9
Median	22	9
Mode	22	10

Table 2 above presented the academic performance of the Grade 6 participants grouped into two - A and B. It can be seen that the scores of the participants in both of the groups are low and almost equal.

Table 3 depict a slight difference or improvement of the academic performance of the Group A participants basing from their pretest and posttest, while there is a visible big difference in the Group A participants. The significant difference is further discussed in the analysis of variance as follows.

Analysis of Variance

ANOVA GROUP A						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
A pre	30	53	15.6	0.3		
A post	30	65	9	0.1		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	48.4	1	48.4	74.46154	2.52E-05	5.317655
Within Groups	15.2	8	0.65			
Total	15.6	9				

Group A depicted an F ratio of 74.46154 which means that there is significant difference between the scores of the Group A participants as basing from their pretest and post test scores. Also inferring that the intervention Game-Based Learning had significantly improved the academic performance of the Grade 6 participants in MAPEH. Thus, Game-Based Learning is deemed effective.

ANOVA GROUP B						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
B pre	30	44	6.8	0.7		
B post	30	44	6.8	0.7		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	1	0	0	1	5.317655
Within Groups	5.6	15	0.7			
Total	5.6	16				

Group B depicted an F ratio of 0 which means there is no significant difference between the scores of the Group A participants as basing from their pretest and post test scores.

CONCLUSIONS

This study was conducted to determine the effectiveness of “Game-Based Learning” as an intervention in improving the MAPEH skills of Grade 6 students in Parian Elementary School, Mangatarem II District, Schools Division Office I Pangasinan School Year 2023 – 2024. Specifically, this study answered the following: 1. The age and gender profile of the Grade 6 learner-respondents ; 2. the level of academic performance in MAPEH of the Grade 6 learner-respondents ; 3. the level of academic performance in MAPEH of the Grade 6 learner-respondents after integrating Game-Based Learning as an intervention; 4. the significant difference between the academic performance in MAPEH of the Grade 6 learner-respondents after intervention integration.

Thus, the following have been concluded:

1. The immersive application of games in the lesson could be more motivating to students.
2. An effective educational game should include challenge, curiosity, and fantasy such as Dimension M which is divided into a series of missions, provides element of challenge.

3. Effective learning method involves role play, which meets the criteria for fantasy. The organization of the game into various missions provides curiosity. Teachers could use the game as a core part of their lesson, although as research has shown, supplemental use has had significant impacts on learners.

3. Teachers should be willing to incorporate more technology into the classroom, especially ones that have been proven to improve student motivation, and achievement.

4. Game-based learning provides students with the type of learning environment that they prefer that is opposite to the traditional classroom, and allows students to develop the skills that are required of them in the workforce.

5. The teaching style and approach used by teachers should change over time. The application of technology to teaching processes such as game-based learning is one of the mediums of learning that can engage students in mastering MAPEH.

6. Game-based learning method can be effective.

RECOMMENDATIONS

1. Strategic teaching is a must for students to develop interest necessary to make them engage to learning.

2. Teachers should be willing to incorporate games to help reinforce and consolidate topics for their students both in the classroom, and perhaps as homework, as well when possible.

3. Innovative learning approach such as game-based will surely help students address both academic and non-academic skills essential for success in their learning.

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