
| RESEARCH ARTICLE

BSED Mathematics Students' Knowledge, Attitudes, and Experiences of Classroom Gamification in the Philippines

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| ABSTRACT

Gamification, implemented through both conventional and technology-enhanced approaches, is widely recognized as an effective strategy for enhancing student engagement and learning. This study examined junior high school mathematics teachers' knowledge, attitudes, and experiences regarding the use of gamification in the classroom. Specifically, it aimed to determine the extent to which teachers understand, value, and apply gamified strategies to motivate learners. A descriptive–correlational research design was employed, utilizing a survey questionnaire to collect data on respondents' demographic profiles, as well as their knowledge, attitudes, and experiences with gamification. The participants consisted of 33 junior high school mathematics teachers from the Mandaue City South District. Findings revealed that teachers' profile variables did not significantly influence their knowledge and attitudes toward gamification. However, a significant relationship was found between profile variables and teachers' experiences, particularly in terms of educational attainment and teaching experience. The study recommends the provision of targeted training and professional development programs to enhance teachers' competence in effectively integrating gamification into classroom instruction.

| KEYWORDS

Attitude, descriptive – correlational, experiences, gamification, knowledge, Philippines

| ARTICLE INFORMATION

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INTRODUCTION

The conventional educational landscape is changing, and there is an increasing need to engage and encourage students in novel ways. Gamification in the learning environment is a potential approach in accomplishing these goals. According to López et al. (2021), researchers assert that gamification of education can help students' motivation, engagement, and behavioral improvements. However, in to the study of Xiao (2022), there are several factors that could affect the outcomes of gamification such as duration, student personality and game mechanism. Toda et al. (2018) added that game-based design could lead to a negative impact. Thus, it is important that educators are knowledgeable, has a positive attitude towards it and enough experience with such games incorporated in the activities so negativities will be avoided and gamification will be effective.

Gamification involves adding game elements to non-game contexts to boost user experience and engagement. Despite the lack of a universally accepted definition, it has gained significant attention from educators and researchers across various fields, leading to a

rise in educational game-related systems. Proper use of gamification is important as it can enhance the development of mathematical skills and increase engagement and enjoyment in learning, especially since interest in Mathematics is declining.

The 2022 Philippine International Student Assessment (PISA) results showed that 15-year-old students from the Philippines ranked 77th out of 81 countries in science, math, and reading. This is very concerning and needs to be addressed. One way to improve this is by using gamification. A recent study by Corpuz-Sanchez and Pasia (2023) on Grade 7 students found that they liked gamified learning in math. They appreciated the clear goals, easy access, feedback, challenges, and teamwork involved. After using gamified learning, students showed more interest and engagement in math. However, the study also noted that many teachers do not know how to use gamification properly, which could lead to problems and reduce the effectiveness of this approach. Because of this observation, the researcher ventured to study knowledge of, attitudes toward, and experiences with the gamification activities in the classroom to determine if the profile and the level of perception as well as the experience of the respondents toward gamification of classroom activities has a significant correlation. Furthermore, the same wanted to help students to acquire a meaningful and enjoyable learning. It is also the researcher's intention to help mentors on their professional development. Lastly, the author wanted to give indicators to administrators in relation to the possible actions that may resolve the situation.

Although there have been numerous studies on the effects of gamification on learning mathematics, a comprehensive exploration of math teachers' knowledge of, attitudes toward, and experiences with gamification activities in the classroom remains understudied. The aforementioned studies focused on the effects of gamification on the performance of the learners. In addition, most of the previous studies conducted focused on gamification which are limited to online applications and the use of technology.

Understanding math teachers' knowledge of gamification, their attitudes toward it, and their classroom experiences with gamified learning is crucial, as these factors significantly influence students. Engaging learners with mathematical concepts is vital for their future academic success. Therefore, by exploring math teachers' familiarity with, perspectives on, and experiences in using gamification, educators can gain deeper insights into its impact on math education. This includes assessing the effectiveness of gamification tools and understanding how students perceive and interact with a gamified learning environment. The study's findings aim to enhance educational practices, support teacher professional development, and further the discussion on integrating gamification into mathematics education.

Theoretical Background

This study is anchored on the Theory of Constructivism (Piaget, 1896), Theory of Planned Behavior (Ajzen, 1991), Experiential Learning Theory (Kolb, 1984) and Self-Determination Theory (Deci & Ryan, 2000). This study is also based on 1987 Constitution Article XIV Section 1 and DepEd Memorandum No. 44 Series of 2015, "the Guideline on the Enhance School Improvement Planning (SIP) Process and the School Report Card (SRC).

Constructivism holds that learners actively develop their knowledge via experiences and interactions with their surroundings. Constructivist teaching is based on constructivist learning theory and has been used to create appropriate curriculum and teach a variety of disciplines. Constructivist learning theory has its origins in the work of Bruner and Vygotsky. According to Pande and Bharathi (2020), numerous teaching-learning techniques have developed and advanced over many decades, emphasizing the importance of students learning from their experiences.

In the context of constructivism, teachers will only serve as facilitators. However, the age and experience of Mathematics teachers are likely to affect their willingness to embrace innovative teaching approaches, such as gamification. More experienced teachers may resist in going beyond new ways into their teaching practices, whereas younger teachers may already be familiar with and comfortable with technology-driven methods but has difficulty in its integration. Despite this, educational institutions and teachers should see to it that learning that happens in their hands are competitive and of quality.

Moreover, the ability to understand and work with numbers is essential for a child's success in math. According to Balt et al. (2020), early numeracy has been found to be one of the strongest predictors of later success in learning. Equipping children with a sound conceptual numerical understanding should therefore be a focus of early primary school mathematics.

In addition, engagement is a critical component of effective learning. Consequently, one of the primary duties of teachers is to ensure that students actively participate in the lesson delivery, especially because engagement has been proven to be positively related to students' academic achievement. Learners who are actively involved in the learning process are more likely to be motivated to investigate, comprehend, and apply mathematical topics, which further means that the more students are involved and engaged, the more likely they are to succeed academically (Delfino, 2019).

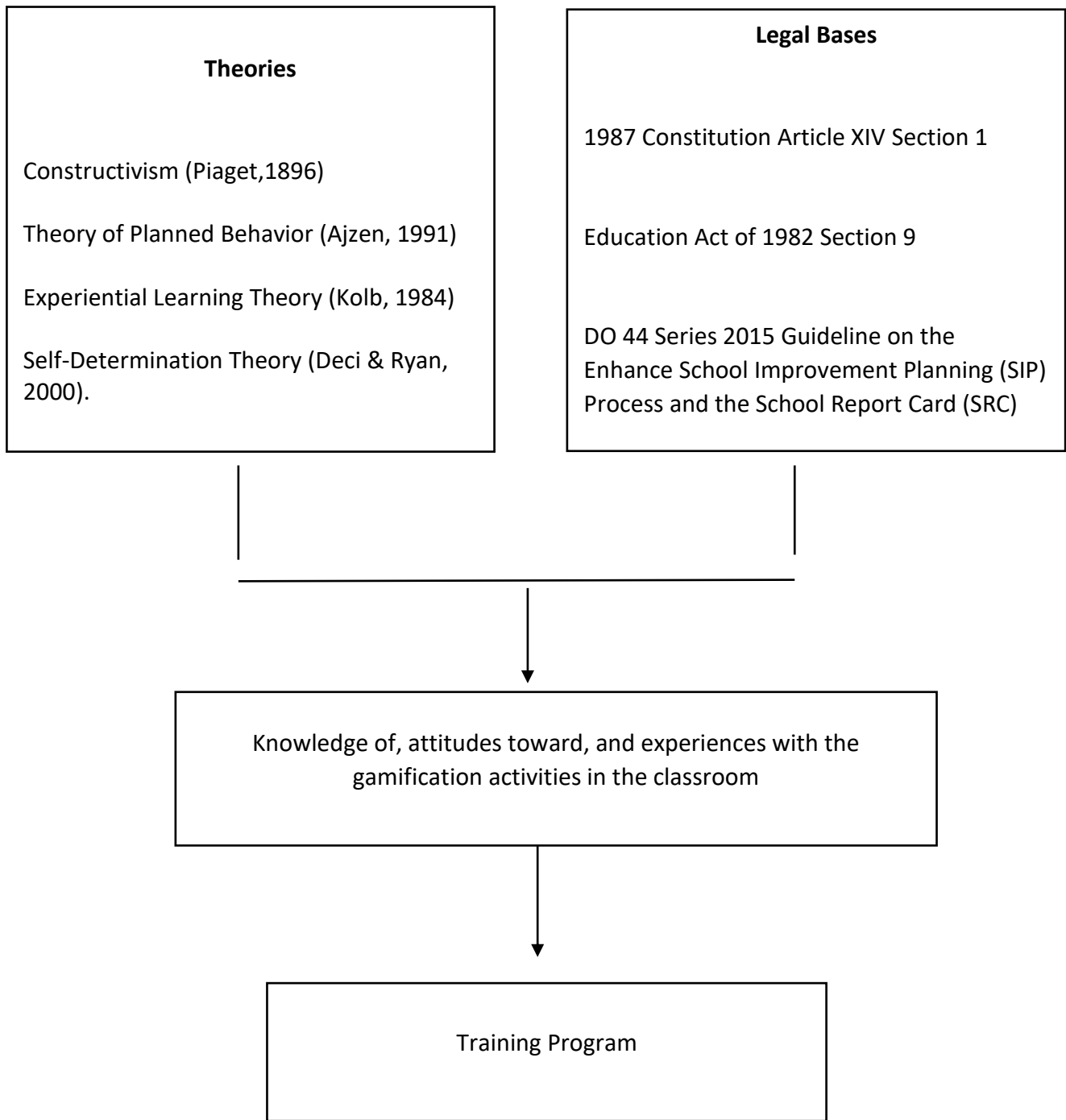


Figure 1
Theoretical Framework of the Study

Stressed by 1987 Constitution Article XIV Section 1, to protect and promote the right of all the citizens to quality education at all levels. Added by The Education Act of 1982 Section 9 stating that all students had the right to receive competent instruction, relevant quality education. Therefore, the institutions as well as the educators are mandated to provide quality education to all the learners. In addition, they are free to choose any technique and strategies that could fit the learning differences of the learners as well as approaches that is relevant to their needs and likes.

DepEd Memorandum No. 44 Series of 2015, "the Guideline on the Enhance School Improvement Planning (SIP) Process and the School Report Card (SRC)" aims to strengthen School-Based Management (SBM) by further devolving the governance of education to schools, empowering school teams and personnel, as well as making the delivery of education services to the learners more responsive, efficient and effective through an enhanced school planning and communication process. It clearly stresses that everyone must be prepared enough to carry out the responsibilities specially the teachers. With that, teachers shall be very aware of the different techniques and strategies needed for the variety of learners in a school setting.

Furthermore, Theory of Planned Behavior (TPB) includes attitudes, subjective norms, and perceived behavioral control as determinants of a person's intention to engage in a behavior. The theory of planned behavior (TPB) has been applied successfully to explain and predict behavior in a variety of behavior domains, according to Aries et al. (2020). It begins with a clear characterization of the behavior of interest, including the target, the activity involved, the context in which it happens, and the period. Each of these aspects has varied degrees of specificity or generality. With the context of TPB, the attitude of a math teacher toward gamification, subjective norms (impact from colleagues and school culture), and perceived behavioral control (confidence in implementing gamification) may all be investigated in connection to their age and teaching experience.

Self-Determination Theory by Deci and Ryan (2000) considers the interaction of extrinsic factors operating on people and the intrinsic goals and desires inherent in human nature. This also examines how social and cultural elements influence people's sense of choice and initiative, as well as their well-being and performance quality. Conditions that promote an individual's sense of autonomy, competence, and relatedness are thought to create the most volitional and high-quality kinds of motivation and involvement in activities, such as improved performance, persistence, and creativity. Therefore, there is a need to inspect the assertiveness of the teachers in relation to the level on how they acknowledge gamification. Legault (2017) posited in self-determination theory humans are motivated by a desire to progress. This motivating potential of gamification in education is an important factor. Motivation solves the issue of why something is significant enough for an individual to complete a task from start to finish. It is considered in self-determination theory in terms of both internal and extrinsic motivation (Sun et al., 2017).

As cited by Fulton (2019), in the context of self-determination theory, competence, autonomy, and relatedness are areas that can be created and implemented in a learning environment (Sailer et al., 2017). In addition, SDT argues that individuals grow and develop according to their psychological needs (Kim et al., 2018). Consequently, psychological needs are those foundations human beings need to be happy, productive, and free of negative consequences. Teachers then need training that is more appropriate and seminars to prepare them with the proper use of gamification.

In relation to the investigation of the Math teachers' experience toward gamification, it is necessary to look into the experiential learning theory by Kolb (1984). This is the theoretical foundation for experiential learning that entails learning by experience is better and meaningful. When the teacher already had a wide experience in relation to gamification, then they already had a lot to share to their learners, which will make them effective, and at the same time efficient.

In the context of teaching Mathematics to Junior High School learners, experiential learning advocates for hands-on activities, real-world problem solving, and interactive experiences that facilitate the ability of learner to explore mathematical concepts. Teachers with greater experience may have gone through cycles of experiential learning and may be more inclined to engage with gamification as a type of active experimentation in their teaching techniques.

Experiential learning on the part of the learners, according to Kolb (cited by Morris, 2020), outlines the optimal learning process, allows learners to recognize themselves as learners, and empowers them to take responsibility for their own learning and growth. Furthermore, Kolb stated how learners learn reflects how they approach life in general. It is also how they solve issues, make decisions, cooperate in teams, and deal with everyday challenges. Isabelle (2020) asserted that gamified experiential learning approaches provide a foundation for generating strategies that engage and excite students. Those experiences engraved on the learners' minds, assisting them in retaining knowledge and remembering facts. Thus, it is critical for teachers to provide opportunities for learners to have experiences based on what they are learning. Teachers may assist in creating situations in which learners can learn and have experiences at the same time.

Learning by doing is the best approach to knowledge. According to Cherry (2020), the experiential learning process promotes performance improvement, learning, and growth and has two aims. First is to learn about a certain subject, and the second is to learn about one's own learning process. She also defined the ideal learning process as a four-step experiential learning cycle: experiencing, reflecting, thinking, and acting.

Giving learners the ability to make decisions about their learning promotes a learning environment in which they feel more in control of how they learn, which motivates them (Kim et al., 2018). They may determine what they can attain in a setting where they have choices. Choice provides learners with a sense of control, resulting in a sense of autonomy, which improves intrinsic motivation (Jeno et al., 2019). Learners are motivated to learn when their basic psychological needs for self-determination are met (Jeno et al., 2019).

The learners of this generation are very interested in video and digital gaming. In comparison, according to Kam and Umar (2018), the school features various game-like characteristics that are similar to conventional gaming components. Students encounter obstacles in school assignments or examinations similar to game quests, and like game points, they receive grades for their accomplishments. Marks earned converted to grades are similar to badges, and academic standing is similar to leaderboard ranks that allow students to advance to the next level at the conclusion of the academic year.

Furthermore, learners frequently devote significant time to playing digital or mobile games in order to conquer the obstacles presented and move to higher levels of the game. Such behavioral endurance, however, is uncommon in school. Kam and Umar (2018) further claimed that instead of perseverance, boredom and disengagement are frequent attitudes among children when it comes to schoolwork.

A study by Smiderle et al. (2020) that was published in *Smart Learning Environments* examined how gamification affected students' behavior, learning, and engagement—with a special emphasis on personality factors. In order to compare a gamified learning environment—which includes features like points, badges, and rankings—with a traditional one, the research team conducted a four-month experiment with undergraduate students enrolled in a programming course. The results showed that the efficiency of gamification varied according to individual personality factors, indicating that learning experiences could be maximized by customizing gamification tactics to student characteristics.

A further comprehensive assessment of the literature by Khaldi et al. (2023) in *Smart Learning Environments* looked at the use of gamification in higher education's e-learning platforms. The difficulty of choosing suitable game components to raise student enthusiasm and lower dropout rates was brought to light by this study. According to the review, leaderboards, badges, and points were frequent gamification aspects, and there was a growing tendency towards adding deeper components like challenges and storytelling. It did, however, highlight a dearth of empirical research based on motivating theories, pointing to a vacuum in the use of theoretical frameworks in gamification design.

Studies examining the impact of gamification practices on academic performance discovered that these strategies enhanced students' involvement and attitudes. One research by Öztürk and Korkmaz (2020), for instance, discussed a gamified exercise called "Keep Dancing," in which students had to answer questions while taking part in a game. According to the findings, students in the gamified group outperformed students in a traditional learning environment in terms of engagement and learning outcomes.

In this context, it is empirical to note that gamified classroom activities that teachers craft for their learners' meaningful engagement in the classroom would also provide an avenue for each learner to experience the learning cycle and get totally engaged and motivated in the process or while in the learning cycle. Investigating math teachers' gamification adoption while considering their age, attitude, and teaching experience is beneficial, and it is critical to recognize that individual differences, contextual factors, and personal beliefs all play a role in shaping teachers' approaches to integrating gamification into their classrooms.

The literature on gamification in classroom activities reveals a complex landscape where the effectiveness of gamification strategies can vary significantly based on individual student characteristics, the specific educational context, and the design of gamified elements. While many studies report positive outcomes in terms of engagement and learning, there are also notable challenges and limitations that warrant further investigation. Future research should focus on developing robust theoretical frameworks and empirical studies to guide the effective implementation of gamification in diverse educational settings.

OBJECTIVES OF THE STUDY

This study aimed to determine the Junior High School Mathematics teachers' knowledge of, attitudes toward, and experiences with the gamification activities in the classroom in Mandaue City South District, Division of Mandaue for the School Year 2023 – 2024.

Specifically, this study sought to answer the following questions:

1. What is the profile of the respondents in terms of: age; gender; educational attainment; and length of teaching experience?
2. What is the level of perception of the respondents toward gamification of classroom activities in terms of: understanding; perception of; and experiences?
3. Is there a significant correlation between the profile of the respondents and their level of perception towards gamification of classroom activities?
4. Based on the findings, what output can be proposed?

Statement of the Null Hypothesis

Based on the objectives of the study, the following null hypothesis were tested at a 0.05 level of significance:

Ho1: There is no significant correlation between the profile and the knowledge of the respondents toward gamification of classroom activities.

Ho2: There is no significant correlation between the profile and the attitude of the respondents toward gamification of classroom activities.

Ho3: There is no significant correlation between the profile and the length of experience of the respondents toward gamification of classroom activities.

METHODOLOGY

Research Design

This study made use of a descriptive correlational research design. The profile of the respondents was correlated with their level of perception towards gamification of classroom activities. An adapted survey questionnaire was used to determine the Junior High School Mathematics teachers' knowledge of, attitudes toward, and experiences with the gamification activities in the classroom.

The idea of the IPO model serves as the foundation for this study's flow. The input of this research includes the math teachers' profile and their perception level toward the gamification of classroom activities. Along with knowledge, attitudes, and experience, the significance of the relationship between the respondents' profile and perception level in terms of their understanding, perception of, and experiences toward the gamification of classroom activities was tested. Appropriate statistical methods in this research were employed to process the data gathered through an adapted survey questionnaire. The research finding was utilized in creating a training program that will help learners in studying junior high school mathematics.

Environment

This research was carried out in the public junior high schools of the Mandaue City-South District, within the Division of Mandaue City, Philippines. In the Central Visayas region sits the highly developed beachfront city of Mandaue. Despite being a heavily developed metropolis and being administratively independent, Mandaue is frequently included in discussions about the island province of Cebu. Mandaue has 27 barangays.

Respondents

The respondents were the Junior High School Mathematics teachers in the secondary schools of Mandaue City South District of Mandaue. Total enumeration was used including all of the 33 teacher respondents in this study. The distribution of Mathematics teachers in each school is shown in Table 1.

Table 1. Respondents of the Study

Division	Frequency (N)	Percentage (%)
TNHS	16	48.48
STVS	11	33.33
BNHS	6	18.20
Total	33	100.00

Table 1 shows the population of the respondents. There is a total population of 16 teacher (TNHS), 11 teachers (STVS) and 6 teachers (BNHS). Those teachers will answer the survey questionnaire.

Instrument

The questionnaire was the main tool in gathering the data. The construction was based on the objectives of the study. It has two parts. The first is the respondents' profile – age, gender, education attainment and teaching experience. Second is on the teacher's level of perception toward the gamification of classroom activities. The adapted questionnaire comprises 30 items: 10 for understanding gamification, 10 for the perception of gamification, and another 10 for the experience with gamification. These items were based on the study of Fisher et al. (2014) A study of business teacher educators' knowledge of, attitudes toward, and experiences with the gamification of the activities in the classroom.

The survey questionnaire was pilot-tested before the conduct of the study to ensure internal consistency, validity, and reliability. The respondents were the Junior High school Mathematics teachers of Jagobiao National High School, Division of Mandaue. The Cronbach alpha value was 0.70 and interpreted as Acceptable internal consistency.

Gathering Procedure

A transmittal letter of approval to conduct a survey to the Junior High School Mathematics Teachers was signed to secure permission from the office of the Public Schools Division Superintendent and Public Schools District Supervisor (PSDS) of DepEd Mandaue– South District Secondary Schools. Permissions from the different school principals were also secured to distribute the questionnaires to the identified teacher respondents of the study. Upon approval of the school principals, the researchers started the study. The survey questionnaire on the perception of Junior High School Math teachers' knowledge, attitudes, and experiences toward gamification of classroom activities was accomplished. The accomplished questionnaires were collected for the data to be tallied and tabulated.

Statistical Treatment

In analyzing the profile of the respondents, the simple percentage formula was used; means and standard deviations were computed for the age and length of experience; modes were used to describe the gender and educational attainment.

To determine the level of perception of the respondents toward gamification of classroom activities the weighted means, medians, and standard deviations were used. To determine the significance of the correlation between the profile and the level of perception of the respondents toward gamification of classroom activities the Multiple R and the significance of R were used.

Ethical Considerations

In conducting this study, informed consent is paramount. Participants received comprehensive information about the study's purpose, procedures, risks, and benefits. They signed consent forms indicating their voluntary participation, with the freedom to withdraw at any time without consequences. Extra care was taken to ensure that vulnerable groups understood the study and consented voluntarily.

Confidentiality and privacy of all participants was maintained. Personal data were securely stored and accessible only to the research team. Participants' identities remained anonymous in all published results, and data were destroyed after a set period to ensure privacy. The study minimized any potential risks to participants, with clear communication of any risks and measures to address any adverse effects.

The study is committed to ethical principles such as beneficence, non-maleficence, respect for persons, and justice. It was ensured that the research benefits individuals or society and that these benefits outweigh any risks. Participants were treated with dignity, and the selection process was fair and equitable. The study underwent review and approval by the ethics committee, and participants were debriefed to provide clarity and support. Monitoring was ensured in adherence to ethical standards throughout the research process.

RESULTS AND DISCUSSION

Profile of the Respondents

The profile of the respondents in terms of age, gender, educational attainment and years of teaching experience were taken into consideration to find out its frequency and determine its relevance to the study. The results are shown in Table 2. Frequencies, percentages, means, and standard deviations were computed to describe the profile variables.

Age

Table 2 shows that most (19) teachers fell under the age above 40 with a mean of 42.73 and SD of 8.55. The teachers are also female with a frequency of 26 or 78.79% of the population while males are 7 or 21.21% of the respondents.

Sarabia and Collantes (2020) stated that teachers who are at early 40s are at their peak of productivity at work than those that are younger. Romanes and Veniegas (2018) also concluded that boomers or teachers who are of age more than 40 have utilized modern teaching and learning skills more deeply than those that age 30-40. Thus, most of the respondents are in the right age and is ready for more professional training. The data above indicates that women between the ages of 30 and 40 make up the bulk of those in this group.

Table 2. Distribution of the Respondents by Profile Variables (n=33)

Profile Variable		f	%
Age			
< 30 years old		4	12.12
30 - 40 years old		10	30.30
> 40 years old		19	57.58
<i>Mean</i>		42.73	
<i>SD</i>		8.55	
Gender			

Male	7	21.21
Female	26	78.79
Educational Attainment		
Bachelor's degree	6	18.18
Completed Academic Requirements	23	69.70
Master's degree	4	12.12
Length of Teaching Experience		
less than 5 years	1	3.03
5 to 15 years	24	72.73
more than 15 years	8	24.24
<i>Mean</i>	<i>14.39</i>	
<i>SD</i>	<i>7.04</i>	

Gender

As shown in Table 2, there were more female teachers with 26 out of 33 or 78.79%, than male teachers with seven or 21.21%, the lesser number of teachers.

Educational Attainment

Likewise, Table 2 depicts that 23 teachers, or 69.70% of the respondents had garnered Complete Academic Requirements or CAR. This is followed by six teachers or 18.18% who are still on their Bachelor's Degree and only four teachers or 12.12% completed their master's degree.

Teaching Experience

In terms of experience, more than half or 72.73% are 5-15 years of teaching. Eight teachers or 24.24% have more than five years and only one teacher or 3.03% has less than 5 years in teaching.

The outcome shows that most of the respondents in this group are female, aged above 40 years old who already garnered their Master's Degree, and have teaching experience ranging from 5-15 years. The majority of teachers hold a bachelor's degree and have seven to fifteen years of experience in the classroom.

It was pertinent to Sarabia and Collantes research (2020) who reported that the majority of teachers are between the ages of 41 and 50, then 30 and 40, with very few falling between the 21 and 30 age range. They also concluded that teachers under the age of forty are, on average, more productive at work than their younger counterparts. With assistance from Romanes and Veniegas (2018) who concluded that teachers older than 40, or boomers, have adopted modern teaching.

Level of Perception of the Respondents Toward Gamification of Classroom Activities

The 33 respondents were surveyed, and the results were analyzed to determine their level of perception in terms of knowledge, attitude, and experiences toward gamification in the classroom. This answered the question of what is the level of perception of the teachers in terms of knowledge, attitude, and experiences.

Knowledge on Gamification

The knowledge of gamification section consisted of ten questions and contained a ranking scale of 1-4 with 4 Strongly Agree (SA), 3 Agree (A), 2 Disagree (DA), and 1 Strongly Disagree (SD).

Table 3 presents the analysis of the knowledge and understanding of the 33 teachers of Mandaue South District, Division of Mandaue, Philippines.

Table 3. Perception of Respondents Toward Gamification of Classroom Activities (Knowledge)

Knowledge of Gamification	WM	Median	SD	Interpretation
I am familiar with the term gamification.	3.30	3.00	0.47	Very High
Gamification is not the same as playing games in a classroom.	3.06	3.00	0.66	High
Board games are not examples of gamification.	3.00	3.00	1.06	High

I do not know what the term gamification means.	2.88	3.00	1.22	High
There are differences in gamification and gaming in education.	3.15	3.00	0.67	High
Building websites is an example of gamification.	3.06	3.00	0.66	High
Playing math skill games in the classroom is an example of gamification.	3.88	4.00	0.33	Very High
Computerized reading tests are not an example of gamification.	2.70	3.00	0.85	High
I know how to apply the basic elements of game design to activities in the classroom.	3.30	3.00	0.85	Very High
Giving badges to learners does not mean gamification in the classroom.	2.15	2.00	0.87	Low
Overall Rating	3.05	3.00	0.90	High

Mean Ranges: 1.00 – 1.75 Very Low; 1.76-2.50 Low; 2.51-3.25 High; 3.26 -4.00 Very High

The data on respondents' perceptions of gamification in classroom activities indicates a generally high level of knowledge about the concept. Most respondents are very familiar with the term gamification (WM=3.30) and understand that it differs from simply playing games in class (WM=3.06). There is high recognition that board games (WM=3.00) and computerized reading tests (WM=2.70) are not considered gamification, while playing math skill games is correctly identified as an example (WM=3.88). Despite some confusion about specific aspects, such as the meaning of the term gamification (WM=2.88) and the use of badges (WM=2.15), respondents show very high confidence in applying game design elements in the classroom (WM=3.30). Overall, the respondents' knowledge about gamification is rated high (WM=3.05), indicating a strong understanding with some areas needing clarification.

Attitude Towards Gamification

Teachers need to have a positive attitude when it comes to implementing the gamification method to have effective and high-quality learning. This allowed for a survey and testing of the 18 respondents' attitudes.

The replies of the respondents to the ten (10) item survey questionnaire that Fisher et al. (2014) modified from their study are displayed in the table. The weighted mean, median, and standard deviation were used to analyze the data in the study.

The data on respondents' perceptions toward gamification in classroom activities reveal a range of attitudes. Respondents generally view gamification positively, recognizing its potential to increase motivation for learning (WM=3.61) and viewing it as a more effective instructional strategy than traditional lectures (WM=3.73). Additionally, they believe gamification enhances competitiveness among classmates (WM=3.45). However, there is some concern that gamification might reduce the time available for real instruction (WM=3.06) and might be seen merely as a way to play in the classroom (WM=2.85). Despite these positive perceptions, there is a notable fear and negativity toward the use of technology and games in the classroom. Respondents express significant apprehension about technology (WM=1.33) and the use of games (WM=1.42), with many disagreeing that games are appropriate only in technology classrooms (WM=1.79) or that they negatively influence student behavior (WM=1.85). The overall rating of attitudes toward gamification is slightly negative (WM=2.44), indicating a mix of enthusiasm for its benefits and concern about its implementation and impact.

Table 4. Perception of Respondents Toward Gamification of Classroom Activities (Attitude)

Attitudes Toward Gamification	WM	Median	SD	Interpretation
Gamification reduces the amount of time for real instruction in the classroom.	3.06	3.00	0.66	Positive
Technology scares me.	1.33	1.00	0.48	Very Negative
Gamification increases motivation for learning.	3.61	4.00	0.50	Very Positive
Using games is a more effective instructional strategy than classroom lectures.	3.73	4.00	0.45	Very Positive
Competitiveness between classmates is increased with the use of gamification.	3.45	4.00	0.62	Very Positive
I am afraid of using games in my classroom.	1.42	1.00	0.71	Very Negative
Gamification is only appropriate in technology classrooms.	1.79	3.00	1.25	Negative
Games are a way to play in the classroom.	2.85	3.00	0.67	Positive
Games are not a useful strategy to increase student learning.	1.30	1.00	0.47	Very Negative
Games negatively influence student behavior in the classroom.	1.85	2.00	0.62	Negative
Overall Rating	2.44	3.00	1.14	Negative

Mean Ranges: 1.00 – 1.75 Very Negative; 1.76-2.50 Negative; 2.51-3.25 Positive; 3.26 -4.00 Very Positive

Experiences on Gamification

The degree to which instructors have used gamification influences their attitudes toward adopting this tactic. The weighted mean, median, and standard deviation were used to survey and test their experiences in this section.

Table 5 displays the eighteen (18) respondents' answers to the survey's ten (10) items, which Fisher et al. (2014). The weighted mean, median, and standard deviation were used to analyze the data in the study on the experiences toward gamification of classroom activities.

Table 5. Perception of Respondents Toward Gamification of Classroom Activities (Experiences)

Experiences with Gamification	WM	Median	SD	Interpretation
I use various technologies on a daily basis (i.e., cell phone, tablet, computers, etc.).	2.94	3.00	0.66	Agree
I often play games outside the classroom via technology.	2.39	3.00	0.70	Disagree
I often play board games outside the classroom without the use of technology.	2.45	2.00	0.51	Disagree
I often played video games as a child/adolescent.	2.06	2.00	0.86	Disagree
I rarely played board games as a child/ adolescent.	1.79	3.00	0.60	Disagree

Playing games is a waste of time.	2.15	2.00	0.51	Disagree
I regularly use games in the classroom.	1.91	2.00	0.72	Disagree
I am interested in learning how to develop gaming techniques in my classroom.	3.70	4.00	0.53	Strongly Agree
Assignments in my classroom require students to use technology.	2.24	2.00	0.61	Disagree
I teach students how to use games as an instructional tool.	2.00	2.00	0.66	Disagree
Overall Rating	2.36	2.00	0.82	Disagree

Mean Ranges: 1.00 – 1.75 Strongly Disagree; 1.76-2.50 Disagree; 2.51-3.25 Agree; 3.26 -4.00 Strongly Disagree

The data on respondents' perceptions towards gamification in classroom activities reveals a generally lukewarm attitude towards gaming and its application in education. While respondents agree that they use various technologies daily (WM=2.94, Median=3.00, SD=0.66), they largely disagree with regularly playing games, whether via technology (WM=2.39, Median=3.00, SD=0.70) or as board games (WM=2.45, Median=2.00, SD=0.51). They also tend to disagree with the notion that they often played video games (WM=2.06, Median=2.00, SD=0.86) or rarely played board games (WM=1.79, Median=3.00, SD=0.60) in their youth. Most respondents do not consider playing games a waste of time (WM=2.15, Median=2.00, SD=0.51) but do not regularly use games in their teaching (WM=1.91, Median=2.00, SD=0.72). There is a strong interest in learning how to develop gaming techniques for classroom use (WM=3.70, Median=4.00, SD=0.53), though current assignment practices involving technology (WM=2.24, Median=2.00, SD=0.61) and instruction on using games as teaching tools (WM=2.00, Median=2.00, SD=0.66) are infrequent.

Overall, the rating suggests a general disagreement (WM=2.36, Median=2.00, SD=0.82) with the current use and perception of gamification in the classroom.

Significance of the Correlation Between the Profile and the Level of Perception of the Respondents Toward Gamification of Classroom Activities

To investigate whether respondents' experiences, perceptions, and knowledge of gamification activities are influenced by their demographics, an analysis was conducted to explore the relationship between these factors and variables such as age, gender, educational achievement, and teaching experience. A statistical test was used to validate the significance of the responses for the matched variables.

Table 6. Test of the Significance of the Correlation Between Profile and Level of Perception

Paired Variables	Multiple R	R Square	p-value	Significance
Profile and Knowledge	0.388	0.151	0.314	Not Significant
Age			0.241	Not Significant
Gender			0.057	Not Significant
Education			0.488	Not Significant
Length of Experience			0.233	Not Significant
Profile and Attitude	0.101	0.010	0.989	Not Significant
Age			0.977	Not Significant
Gender			0.689	Not Significant
Education			0.785	Not Significant
Length of Experience			0.892	Not Significant
Profile and Experience	0.747*	0.558	0.000*	Significant
Age			0.230	Not Significant
Gender			0.516	Not Significant
Education			0.028*	Significant
Length of Experience			0.004*	Significant

$\alpha = 0.05$ * significant at $p < 0.05$

There is a substantial and significant association between the respondents' profiles and their experience on the use gamification activities in the classroom, as shown in Table 6. These profile variables can account for roughly 55.84% of the variance

in experience, according to the high R-squared value of 0.5584. With respect to awareness of gamification activities, education and length of experience are particularly important predictors, with P- values of 0.028 (2.8%) and 0.004 (0.4%), respectively. This implies that the respondents' awareness of gamification activities is significantly influenced by their profile and experience.

As a result, gamification tactics require professional development that focuses on knowing what technology to use, how to use it, and what pedagogy is acceptable. Lopez et al. (2021) revealed that many educators report feeling uneasy and having not received the necessary training to use these teaching methods. Supported by the study of Fisher et al. (2014) who stated that most of the teachers are interested however unsure on its concepts and its incorporation in the teaching learning process.

However, there is no discernible relationship between the respondents' profiles and how they feel about gamification efforts. The low R Square value of 0.0102 indicates that just 10.2%, which amply illustrates the lack of correlation between the respondents' profiles and their attitudes regarding gamification.

Additionally, there is no correlation between the respondents' profiles and their understanding on gamification activities. According to the R Square value (0.1510), the profile factors account for about 15.10% of the variance in knowledge. It is pertinent to Brigham (2019) study, which demonstrates a positive interaction with the game's application while using them in an instructional setting. Smiderle et al. (2020) found evidence that gamification affected users in distinct ways based on their personality traits. Their results indicated that the effect of gamification depends on the specific characteristics of users.

CONCLUSION AND RECOMMENDATIONS

The findings from the study reveal that profile variables, such as demographic factors, do not significantly influence knowledge and attitude. This suggests that individuals' understanding and perspectives are not strongly shaped by these basic profile characteristics. Instead, other factors, possibly more intrinsic or situational, might be playing a larger role in determining one's knowledge and attitudes. This insight can be valuable for designing interventions and educational programs, as it indicates that focusing on demographic variables alone may not be effective in altering knowledge and attitudes.

However, the study highlights a significant relationship between profile variables and experience, with education and length of experience being particularly influential. This means that an individual's background in terms of their educational achievements and the duration of their involvement in a particular field significantly impacts their experience. Therefore, enhancing educational opportunities and facilitating longer-term engagement in activities or professions could be key strategies for improving overall experience. These findings underscore the importance of targeted educational programs and structured experience-building initiatives in personal and professional development.

Based on the findings and conclusions, the researchers have drawn the following recommendations. The school shall provide seminars, trainings and workshops enhance teacher's familiarity with gamification strategies such as what game to use and how to apply it effectively. The environment, specifically classroom, should be conducive to learning. Recreational mathematics may be used by the math teachers as a technique in changing students' negative attitude in Mathematics. Future thesis writers, they are encouraged to have a research on recreational mathematics in relation to the student's academic performance.

The study's outcome is a Training Program on the application of Gamified activities in the classroom. Three schools will have training programs to assist math teachers in carrying out the plan. The knowledge, attitude, and experiences of the teachers will be improved. Teachers will be equipped with knowledge and skills about the appropriate use of Gamification in their instruction. Additionally, Mandaue City Division schools in the Philippines can adopt the study, which could be very beneficial for all teachers not just in math.

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