

Gamifying Technology and Livelihood Education: Instructors' Lived Experiences with Technology Applications in Core Subject Teaching

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ABSTRACT

There have been many studies about the advantages of gamification method in the teaching and learning process of the students. Studies have shown that it ignites interest, motivates engagements, stimulates positive character and significantly enable students to learn. However, there have been limited studies of incorporating gamification to students in teaching core subjects especially to a practical field in Technology and Livelihood Education. To contribute to the limited studies, this research aims to analyze lived experiences of teachers who employ gamification method using technology applications in teaching core subjects in Technology and Livelihood Education. The six participants of the study were college instructors who handled major subjects for the second semester in the academic year of 2023 to 2024 at a State University in Oroquieta City, Misamis Occidental, Philippines. The research employed phenomenology as its qualitative design. The researchers employed purposive sampling to choose participants and utilized a semi-structured questionnaire for the focus group discussions. The instrument underwent content evaluation by experts. The researchers analyzed the recorded data and transcribed them through conventional content analysis approach to identify and analyze recurring themes. There are two themes that emerged from the discussion: the first theme is “game-based applications are effective methods in teaching and learning process” and the second theme is “barriers in the implementation”. With these, results showed that gamification method in teaching major subjects promotes active participation of students and allows innovative strategies for teachers to employ in class despite having various difficulties. Hence, it is imperative to invest funds for the necessary materials for gamification methods.

Keywords: Technology and livelihood education, teachers' lived experiences, gamification, technology applications, core subjects

INTRODUCTION

Contemporary technology is undergoing fast evolution. Throughout the years, it has deeply transformed the lives of humans. It has developed technologies and resources that possess practical value in enhancing the efficiency and welfare of individuals [3]. With smart home technologies, technological integration becomes an integral part of the everyday routines of individuals and families at home, including tasks such as waking up, showering, cooking, cleaning the house, shopping, and more [20]. Utilizing technology in business sectors provides several benefits such as improved communication and collaboration, increased flexibility and agility, enhanced customer experiences, increased efficiency through automation, and facilitated data analysis for business intelligences [2]. Indeed, in contemporary education, technology has become an indispensable component of the instructional and learning process. Educators employ technology to actively include students in the educational setting. Haleem et al. (2022) employed interactive whiteboards, tablets, smartboards, computers, simulations, and both online and offline programs to augment student involvement [24].

Moreover, the incorporation of technology via applications in the educational process enhances interactivity within the classroom and facilitates teachers in designing instructional plans and devising effective classroom tactics [6]. Gamification is one of the several approaches to employ in the classroom while integrating technology. Gamification is a pedagogical approach employed in educational environments to enhance participation by integrating game components via competitions, challenges, and incentives [39].

Khoshnoodifar et al. (2023) propose a student-centered design that effectively stimulates students to engage in learning. Gamification is applicable in both digital and non-digital settings [29]. Qiao et al. (2022) define digital gamification as the use of online platforms to incorporate activities for students, while non-digital gamification involves physical activities [37].

Meanwhile, in the contemporary educational environment of the 21st century, the students of today are referred to as "digital natives" [36]. According to the Waterford Organization (2021), digital native students are born into a world characterized by fast and continuous evolution of the internet and technology [45]. They represent a group of students who are fully engaged in the pervasive digital realm. Moreover, these pupils exhibit reduced receptiveness to conventional teaching methods, experience frequent boredom in the classroom, and possess a short attention span [8]. Teachers of this generation should engage in a critical analysis of the learning strategies to be used in instruction [9]. Implementing technology-based games greatly enhanced the learning outcomes of these pupils [1]. In comparison, the incorporation of technology in classes for this generation is considered to be revolutionary: it introduces novel learning experiences, improves accessibility, encourages active student participation, and offers individualized learning opportunities [4].

Correspondingly, Technology and Livelihood Education is an immensely practical subject in the Philippine curriculum. The curriculum consists of four components acquired from the fields of Home Economics, Agri-Fishery Arts, Industrial Arts, and Information and Communication Technology. This is the discipline that aims to equip students with the essential knowledge, skills, and competences required for future employment and career development [12]. Teachers in TLE subjects facilitate the development of fundamental life skills in students, therefore equipping them for their future as autonomous adults [22]. Furthermore, this discipline necessitates the proficiency of instructors in managing courses and implementing suitable teaching methodologies and strategies [44].

Moreover, the Technology and Livelihood Education subject significantly differs from other disciplines since it prioritizes skill-based learning. Consequently, educators encounter challenges in identifying methods to convey the skills. Hence, teachers are responsible for core courses must devise and implement pertinent strategies to deliver high-quality instruction to students.

Statement of the Problem

This study addresses the gap in the literature by contributing more researches on how gamification through technology applications can enhance students' interest, motivation and engagement specifically in teaching major subjects for Technology and Livelihood Education course. Purposely, it answered the following questions:

1. What comes into your mind when you hear about gamification method through technology applications in teaching?
2. In what way do you use technology in your gamification activities in teaching major subjects in TLE?
3. How was your experience in gamification with technology applications in teaching TLE classes?

Significance of the Study

The results of the study are beneficial to students, teachers, and administrators. For students, gamification is regarded as a successful learning technique that boosts motivation, learning, and retention. For teachers, combining gamification with technology applications creates a fun and meaningful learning environment for students, which in turn enhances their learning competence. Ultimately, administrators would recognize that the use of technology in the classroom greatly influences the efficiency of teaching and learning. Therefore, it is imperative to designate funding for these applications.

LITERATURE REVIEW

Gamification, the incorporation of game-like features into non-game environments, has become increasingly

popular in educational programs, especially in disciplines such as Technology and Livelihood Education (TLE). This literature study examines the experiences of teachers in the field of Technology and Livelihood Education (TLE) who use gamification techniques through technology applications. It emphasizes the advantages and difficulties they face.

Gamification in Education

The concept of gamification in education is based on motivation theory, namely Self-Determination Theory by Ryan & Deci [38], which suggests that people are driven by autonomy, competence, and relatedness. Implementing gamification features, such as points, badges, and leaderboards, can augment student involvement and motivation [17].

As such, numerous studies highlight the beneficial influence of gamification on student involvement and academic achievements. A study conducted by Smiderle et al., (2020) shown that the inclusion of gamified components can greatly enhance student engagement and motivation [39]. Relatively, Mateus et al., (2020) contended the use of gamification in educational settings as an effective strategy for inclusivity and diverse students [33]. Furthermore, Ghai & Tandon (2022) affirmed that gamification has the potential to revolutionize conventional instructional approaches of teachers, hence enhancing the interactivity and enjoyment of the learning process [23].

Technology Applications in Teaching TLE

Technology applications in Technology and Livelihood Education (TLE), such as simulation software, instructional games, and mobile applications, offer interactive learning settings. A study conducted by Carstens et al., (2024) suggests that the use of these technologies can enhance students' practical abilities, improved learning outcomes, personalized learning and develop their conceptual comprehension, especially in vocational education environments [10]. Technology integration in Technology and Livelihood Education (TLE) field facilitates the connection between theoretical knowledge and actual implementation [28].

Therefore, implementing gamification techniques using technological applications in Technical and Livelihood Education (TLE) has potential opportunities to improve student involvement and academic achievements. Nevertheless, teachers encounter significant challenges that require continuous professional growth and creation of institutional support. In order to evaluate the longstanding impact of gamification on educational practices and student performance, future research ought to focus on longitudinal research.

Lived Experiences of TLE Teachers in Gamification

The experiences of teachers with gamification demonstrate a range of viewpoints. A study conducted by Kilag et al. (2019) emphasizes that educators observe higher levels of student involvement and enhanced educational achievements when they use gamification strategies [27]. But they also encounter obstacles, such as the requirement for sufficient skills and resources to successfully apply these techniques. Eyadat (2023) found that teachers frequently have challenges in reconciling gamification components with prescribed curriculum, resulting in feelings of frustration [19]. Connectively, illustrative case studies demonstrate the pragmatic implementation of gamification in TLE. An investigation carried out by DeMarree and VandenBosch (2018) demonstrates how a teacher of Technical and Livelihood Education (TLE) used a gamified method using a mobile application, resulting in increased student engagement and better transfer of practical skills [15]. Nevertheless, the study also identified difficulties such as diverse student reactions and the need for ongoing adjustment.

Although there are notable advantages, there are also limitations. A significant barrier to the effective adoption of gamification is often identified as the insufficient training and support provided to teachers [6]. Furthermore, Toda et al. (2018) observed that there may be opposition from students who are not familiar with gamified learning environments [43]. Depending on the demographic and technological knowledge of students, the efficacy of gamification can also differ [30].

Theoretical Framework

This work is based on the Gamified Theory of Learning proposed by Landers et al., (2014). It asserted that gamification has the potential to impact learning and facilitate decision-making for teachers who are creating, improving, or developing gamified learning activities. Additionally, teachers remain the primary element in the classroom and gamification should enhance teacher-led instruction rather than replace it. Moreover, gamified learning activities should not be designed to facilitate students in acquiring significant knowledge by memorizing. Instead, they serve as a means of instructional support [32].

RESEARCH METHODOLOGY

Design

The research design of this study utilized phenomenology. Teherani et al., (2005) asserted that phenomenology is a qualitative research design that seeks to understand and describe phenomena from the lived experiences of individuals in a particular situation [42]. The researcher utilized this design to explore the lived experiences of TLE teachers who employed gamification methods with technology applications in teaching major subjects.

Population and Sampling Procedure

The study participants were college instructors from the University of Science and Technology of Southern Philippines, Oroquieta Campus, Mobod, Oroquieta City, Misamis Occidental, Philippines. Six individuals participated in the study. The criteria for the selection procedure were as follows: (1) Educators responsible for core subjects in Home Economics, Industrial Arts, and Information and Communication Technology for the second semester of the academic year 2023 to 2024, (2) possess a degree in Bachelor of Technology and Livelihood Education or related disciplines, and (3) have incorporated gamification as a pedagogical strategy in the classroom.

Participants for this research was selected via purposive sampling, a method commonly employed in qualitative investigations. This sampling technique entails identifying and selecting individuals or groups who possess relevant knowledge and are well-suited to contribute insights regarding the issue or phenomenon under investigation [35,13].

Research Instrument and Validation

The study was conducted through focus-group discussion via Zoom link and used semi-structured questionnaires to facilitate the open-ended questions. The participants were asked about their lived experiences in teaching TLE major subjects with gamification through technology applications as one of their teaching strategies used in the class.

The instrument had undergone content validation from three experts in the field of Technology and Livelihood Education. The experts were College Assistant Professor, Professor and Instructor and were graduates of Technology and Livelihood Education and has teaching experience for more than 10 years.

In the context of content validity, it is often termed "theoretical analysis". It assesses the extent to which a measure accurately analyzes the topic of interest. For the objects to accurately measure their intended variables, they must possess sufficient substance. Content relevance and representations are determined by content validity, indicating that the items must accurately represent the pertinent experiences of the target group under investigation [5].

Data Gathering Procedure

Data was gathered accordingly. A letter was dispatched to the participants, seeking their consent to carry out the study. Following the acquisition of consent, the researcher promptly communicated to the participants the objective of the study. Once ethical considerations were established, the researcher proceeded to conduct the

focused group conversations. For the purpose of data collection, the researcher transcribed and examined the recorded conversations in order to identify recurring themes.

Data Analysis Management

In the data analysis, the researcher utilized conventional content analysis wherein the researcher codes, categorizes and themes the data based on the answers in the focused-group discussion. In conventional content analysis, the researcher is the instrument for making judgment and analyzing the data [26].

Ethical Considerations

To address the potential ethical concerns surrounding this study, the researcher included a letter providing the participants with comprehensive information about the study together with the research questionnaire. The letter was positioned in front of the research study questionnaire. The letter delineates the participants' involvement in the study and their entitlement to withdraw should they choose not to participate. Furthermore, the letter includes the stated objective of the study and guarantees the participants that the collected data will be treated with confidentiality and solely utilized for the study. Every personal information will be handled with the highest level of caution. Finally, the researcher reported to the participants the anticipated outcome of this research endeavor.

RESULTS AND DISCUSSION

Based on the conventional content analysis approach, two themes emerged in the study. The first theme is “Game-based applications are effective methods in teaching and learning process” and the second theme is “Barriers in the implementation”.

Table 1: Themes that emerged from the focused-group discussion

Codes	Categories	Themes
Game-based activities	Game-based method	Game-based applications are effective methods in teaching and learning process
Integrate a certain game		
Employing games or activities		
Combination of game and application		
Modern strategy using apps	Uses applications	
Offline and online applications		
Activities using software		
Motivates students	Positive effects to students' learning	
Makes learning meaningful		
Gets students attention		
Boost participation		
Students are excited		
Ignite interest		
Students having fun		
Class is active		

Improves retention	Ease in application to teachers	
Preferrable to use		
Immediate feedback		
Better than traditional game-based activities		
Easy selection of students		
Easy presentation of activities		
Easy recording		
Easy to execute		
No projector	Limited resources	Barriers in the implementation
Brownout		
No power source		
Intermittent internet connection		
Class becomes noisy	Disruptive students' behavior	
Ignite competition		

Theme 1: Game-based applications are effective methods in teaching and learning process

Under this theme emerged four categories: game-based method, uses applications, positive effects to students' learning and ease in application to teachers. During the FGD, teachers shared that gamification is a game-based activity. P2 said, *“Gamification is an activity that integrates games into the teaching process using laptops, computers or cellphones”* and P1 answered, *“Gamification is a game-based like point systems, scoring and competition in class”*. Some of the participants said that they used applications. P4 said, *“I used online and offline software applications such as Quizzes, Jamboard and Powerpoint Presentations”*. P3 mentioned, *“I used spinning wheel and duck race in calling names for students and kahoot for my activities”*. Other participants found out that employing gamification provides positive effects to students' learning. P6 shared, *“Students are very attentive and it boosts participation to them, especially students in this generation”*. P5 also added, *“The students are very active and I can see that they are really interested in the topic”*. Some of the teachers revealed that game-based applications provide ease in the teaching process. P1 shared, *“Using applications through laptops and projector makes the class enjoyable and as teacher, I prefer to use them because it provided immediate feedback and I can easily record their scores”* P1 added, *“Better than traditional game-based learning because it provides unbiased selection of students especially in oral, example in the wheel of names”*. Therefore, the participants' answers signify that using game-based methods through online and offline applications are effective in the teaching and learning process.

Game-based applications have been gaining enormous popularity from researchers and practitioners because of their positive effects on learning to students. Smithsonian Science Education (2016) has identified five benefits of using gamification methods in teaching: (1) aids in cognitive development in adolescents, (2) in some cases it aids in physical development, (3) increases in the level of engagements in the classroom, (4) aids accessibility in the classroom, and (5) can be done outside the classroom for digital games. Additionally, the use of game-based applications to teachers yields several benefits [40]. Lampropoulos (2023) affirmed that it can facilitate and enrich the teaching process because teachers become creative in making activities for students, it also improves teachers' communication and digital skills and allows motivational learning environments that later on consciously engage students' participation and collaboration [31]. From these perspectives, De Jesus and Gonzales (2022) recommended the continuous usage of game-based applications by teachers because it motivates students to become interactive and engage in class activities [16].

Theme 2: Barriers in the implementation

In this theme, two categories emerged: limited resources and disruptive behaviors of students. These categories were found to be barriers experienced by teachers during implementation. During the FDG, teachers shared that they experience brownouts, intermittent connections, and limited resources which makes it challenging for them to employ gamification during class activities. P1 shared, *"I remember when I employed a gamification method in class then suddenly the power offs, I got lost in the discussion and all our activities were lost."* P2 added, *"I also remember the time I employed gamification in the class became active then suddenly the connection was lost, we also lost all the previous scores of the students. Because of that, the class reactions become sad."* Other teachers experienced a lack of motivation to employ gamification because of the limited resources available. According to P4, *"I wanted to have gamified activities using the projector and my laptop, however, since we only have two projectors in the college and the schedule for borrowing is fully booked, I opt not to borrow anymore and employ another method instead"*. P5 added, *"I also feel sad when I wanted to borrow the projector for my class activity yet I was not able to acquire it due to someone having borrowed it ahead of me. It is so funny that we have to compete with other teachers just to use the projector"*. Some of the teachers also revealed that students become noisy when they employ gamification in the class. P6 mentioned, *"Students are very active in class whenever I employ gamification activities, however, the class becomes noisy and I cannot control their emotions because of the fun they experienced"*. P3 added, *"Whenever I employ gamification activities, the class becomes active yet noisy and I cannot control their emotions. Additionally, our classes happened in the open classroom, with this the yelling and the cheering can be heard in the nearby classes."* Thus, with these answers by the participants, employing gamification methods through technology applications can cause various challenges.

One noticeable resource of technology is the internet. The internet allows people to utilize technology through finding new information, staying in touch with families and friends, watching movies and videos, keeping up to date news and events, accessing and listening to music, researching new products and brands, playing games, finding businesses to engage with and researching for studying assignments in schools [41]. However, when a connection or internet is lost, negative effects will arise. Specifically in the education sector, a poor internet connection can cause students to have many absences from class, teachers will also have difficulty delivering classes especially they are online classes and the teachers will employ other activities considering not using the internet [11]. Moreover, even if studies have shown the positive effects of gamification on class [21] factors such as unclear directions, protests, challenges during the implementation, the creation of negative behaviors, extension of time allotment and a noisy environment were found to be negative barriers [14].

Therefore, in this study, the researchers utilized game-based technology applications in the practical major subjects that they employed in the classroom. The findings indicated that there is positive impact when gamification method is used during class activities and discussions and teachers who engage in this method found active participation of students. Additionally, they used this to allow students to think critically and logically. Despite limited resources and other barriers in the implementation, teachers continue to use this method because they believe that it is important for students to experience not just academic learning but also to have a fun and meaningful semester.

CONCLUSION AND RECOMMENDATION

Gamification is a method that integrates game-based activities through technology applications in the classroom. It is an activity that allows students' to actively engage and collaborate with each other. Gamification effectively stimulates students' interest, enhances the enjoyment and significance of learning, captures students' attention, and promotes increased attentiveness and activity and engagement. Teachers who employed gamification in their classrooms found that students are highly motivated, participative, and interactive. Concurrently, teachers who employed gamification in the classroom reported ease in doing their tasks; they can easily record the scores because there is immediate feedback after the activity. When selecting students to participate, it is easy to employ and can avoid bias with the use of technology applications. In terms of use, they prefer to use gamification as a method in teaching, especially with technology applications, because it is easy to manipulate.

Besides, addressing the barriers in the implementation can be solved through procurement of educational technology resources in the classrooms for instruction and learning. These include adding more educational computers, projectors, improved internet connectivity, and wide, close and well-ventilated classrooms. Students' disruptive behavior can also be addressed through carefully designing and planning for the activities suited for a number of students and the kind environment where the class is employed.

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