

Gamified Strategy: Instructional Tool in Teaching Technology and Home Economics on Students' Digital Literacy and Performance

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Abstract— The study examined the effect of the use of gamification features on students' digital literacy and performance. The study intended to assess the assessment level of gamification features, including components, mechanisms, dynamics, and game characters, and students' digital literacy including content creation, adaptability to new technology, and digital communication skills. It also assessed students' performance in a written test and analyzed the significant effect of gamification features on the students' digital literacy and performance. The study was conducted in the third quarter of the 2024-2025 school year at Los Baños National High School - Batong Malake, Los Baños Sub-Office, Division of Laguna. The study utilized a quasi-experimental method to assess the effect of gamification features on students' digital literacy and performance. It made use of a deliberate sampling technique and had 150 participants. Quantitative analysis was conducted to determine the significant effect of gamification features on students' digital literacy and performance in written tests. Data was analyzed using mean and standard deviation, frequency and percentage, and regression analysis. Based on the analysis of the data, the respondents rated the gamification features "Very High" including components, mechanisms, dynamics, and game characters. The level of students' digital literacy including content creation, adaptability to new technology and communication skills are rated "High" by the respondents. On top of that, the students' performance in a written test was rated as "Very Good" by the respondents. The study found that gamification features have statistically significant effect on students' digital literacy, including content creation, adaptability to new technology, and digital communication skills. However, none of these aspects significantly affected their performance in written test. Factors affecting the results included lack of ICT facilities, sudden weather changes, and the gamified material that made in PowerPoint presentations. Since that there is significant effect of the used of gamification features on students' digital literacy. Therefore, the study concluded that incorporating gamified strategies in teaching improves students' proficiency in using digital technologies for learning, however it also found no significant effect on their performance, indicating that the implementation of gamified strategies in specific academic settings did not significantly affect their written test scores. Considering the conclusions from the findings, the following recommendations are hereby offered; ICTteachers are encouraged to create interactive computer-based learning systems, similar to gamified strategy, to engage students in all grade levels and familiarize them with computer and ICT equipment. Students should actively engage with gamified learning materials, focusing on game-like elements, skill development in content creation, adaptability to new technology, and digital communication skills. This approach can significantly enhance their digital literacy skills, preparing them for future demands and preparing them for the future.

Keywords— Gamification, gamified strategies, digital literacy, digital communication, performance.

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INTRODUCTION

Digital literacy has emerged as a critical ability for students in the quickly changing digital age we live in, where knowledge is accessible with just a click and technology permeates every part of our lives. A broad range of skills are included in digital literacy, which gives pupils the ability to interact, understand, and navigate the digital environment. The Audrins (2022) studies, highlighted not only the importance of individuals' development of digital literacy, but also sheds light on the critical role of digital technologies in education. The 21st century digital skills factor considers the use of digital literacy in a broader sense than only in the classroom.

Gamification is the transformation of academic material into a gaming theme in teaching, transforming the classroom into a large first-person game. This process combines creativity and student choice, fosters peer competition, and provides instant feedback for students to monitor their progress towards learning objectives. Education is becoming more gamified because it has the potential to boost student excitement and participation. When executed correctly, gamification maintains the same learning objectives while adding enjoyment to the learning process. By increasing motivation and engagement, gamification helps lessen studentdriven problems during the teaching process.

According to Dichev & Dicheva (2017), gamification of education refers to the process of introducing game aspects into a learning environment in order to increase student engagement. Many researchers have investigated the impact of gamification in an educational setting, motivated by the positive effects that game elements can have. These researches have yielded favorable effects, including an increase in cooperation, knowledge, engagement, and user retention. (Hakulinen, L., & Auvinen, T. 2015).

In the context of student performance, it is a complex concept that represents a students' overall growth and academic success. It encompasses much more than just grades and test scores; it also includes cognitive abilities, behavioral patterns, and social-emotional development. This complex interplay of variables is influenced by a wide range of internal and external factors, such as the socioeconomic situation, teaching strategies, school environment, and individual

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student characteristics. The complexity of student performance must be fully understood by educators, researchers, and policymakers in order to develop effective strategies that support student success and foster learning.

Therefore, the goal of this study is to determine the effect of the use of Gamification Features in terms of component, mechanism, dynamics and game character on digital literacy including content creation, adaptability for new technology, and digital communication skills. Likewise, this research also aims to determine the impact of these same gamification features on student performance as objectively measured through a standardized written test of selected Grade 9 students in Los Baños National High School- Batong Malake.

1.1 Statement of the Problem

Problem/s which were addressed by the research

This study aims to find out the effect of Gamification Features in terms of component, mechanism, dynamics and game characters on students' digital literacy including content creation, adaptability to new technology, and digital communication skills and Academic Performance of Grade 9 students in Los Baños National High School - Batong Malake.

Specifically, the study aims to answer the following questions:

- 1. What is the assessment level of the gamification features in terms of:
 - 1.1. component;
 - 1.2. mechanism;
 - 1.3. dynamics; and
 - 1.4. game character?
- 2. What is the assessment level of the students' digital literacy in terms of:
 - 2.1. content creation;
 - 2.2. adaptability to new technology; and
 - 2.3 digital communication skills?
- 3. What is the assessment level of the students' performance in terms of a written test?
- 4. Is there a significant effect on the use of gamification features on the students' digital literacy?
- 5. Is there a significant effect on the use of gamification features on students' performance?

II. METHODOLOGY

The study was conducted in the third quarter of the 2024-2025 school year at Los Baños National High School - Batong Malake, Los Baños Sub-Office, Division of Laguna. The study utilized a quasi-experimental method to assess the effect of gamification features on students' digital literacy and performance. It involved 150 respondents and employed a purposive sampling strategy. Quantitative analysis was conducted to determine the significant effect of gamification features on students' digital literacy and performance in written tests. Data was analyzed using mean and standard deviation, frequency and percentage, and regression analysis.

III. RESULTS AND DISCUSSION

This part entails the presentation, analysis, and interpretation of data gathered to answer the problem of this study. This part reveals the findings of the study based on the research questions.

Level of Gamification Features

In this study, Gamification Features was described in terms of Components, Mechanism, Dynamics, and Character and was determined by grand mean and standard deviation.

Table 1, as referenced, offered a thorough analysis of the level of gamification features particularly in terms of their components; this table most certainly showed the average mean (M) for the presence or implementation of various game components, together with their corresponding standard deviation (SD), so indicating the consistency of their application. It also provided a verbal interpretation for these statistical values, therefore providing a qualitative understanding of the extent in which these game components were included into the material of instruction the students underwent. This provides a key basis for understanding the type and strength of the independent variable (Gamification Features) in this study, particularly focusing on the structural and procedural components aimed to engage and motivate the students.

Table 1 presents the Level of Gamification Features in terms of Components.

| TABLE 1. Level of Gamification Features in terms of Component | | | |
|--|------------|-------------------|--|
| STATEMENT | Mean SD | Remarks | |
| The components of the gamified learning materials | | | |
| assist the respondent comprehensively understand the intricate details of the subject matter. | 4.24 0.76 | Strongly Agree | |
| have well specified tasks and instructions that helps the respondent understand the game. | 4.44 0.67 | Strongly Agree | |
| motivates the respondent to focus on accomplishing my study learning objectives. | 4.27 0.85 | Strongly Agree | |
| driven the respondent to do the tasks by achieving game points and finish some quest. | 4.23 0.92 | Strongly Agree | |
| assist the respondent to better comprehend each topic that not easily understand in traditional discussions. | 4.27 0.73 | Strongly Agree | |
| Grand Mean | 4. | 29 | |
| SD Vielelletensetetien | <i>0</i> . | /9 | |
| verbai interpretation | Very | High | |

As presented in table 2, there is a very high level of

gamification features in terms of components with the grand (M=4.29, SD=0.79). This implies that students perceived that the components of the gaming material enhance their learning.

Therefore, in order to actively improve students' understanding of the subject matter, support their intrinsic motivation to learn, and keep a laser-like focus on reaching predetermined learning goals, the gamified learning materials are purposefully structured to provide precise, doable tasks and clear instructions. The content promotes deeper comprehension, which helps

students perform better on tests and-above all-develops healthy, long-lasting learning habits that will help them well beyond the classroom and give them the tools and perspective they need to keep improving in our quickly changing world.

In addition, according to Yang, C., et. al. (2021) emphasized gamification can be an effective mechanism for engaging solvers (users) in crowdsourcing tasks. However,

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there is a lack of understanding about how gamification elements affect these motivations. Points and rapid performance feedback are two popular gamification features. The research, which used self-determination theory as its framework, discovered that points have a positive impact on both intrinsic and extrinsic motivation, whereas immediate performance feedback just improves intrinsic motivation. Both intrinsic and extrinsic motivations positively impact solvers' participation in crowdsourcing. This study provides valuable insights into how to improve the effectiveness of gamification elements and enhance solvers' participation in crowdsourcing.

Table 2, as referenced, provided a detailed breakdown of the level of gamification features specifically in terms of their mechanism, this table likely presented the average mean (M) for the presence or implementation of various game mechanisms, along with their corresponding standard deviation (SD) indicating the consistency of their application. Likewise, a verbal interpretation for these statistical values, so providing a qualitative comprehension of the amount in which these game components were introduced into the material of instruction the students experienced. This offers a crucial foundation for features in this research, with an emphasis on the procedural and structural game mechanisms meant to inspire and engage the students.

Table 2 presents the Level of Gamification Features in terms of Mechanism.

| TABLE 2. | . Level of | Gamificatio | n Features ir | i terms oj | f Mechanism |
|----------|------------|-------------|---------------|------------|-------------|
| | | | | | |

| STATEMENT | Mean SD | Remarks |
|--|-----------|-------------------|
| The mechanism of the gamified learning materials | | |
| increases the respondent's incentive to learn and enjoying the game as well. | 4.44 0.74 | Strongly Agree |
| offers the respondent a sufficient depth for long-term engagement. | 4.09 0.84 | Agree |
| designed to aid the respondent enhance overall gaming experience and enjoying the game at the same time. | 4.31 0.74 | Strongly Agree |
| encourage the respondent's creativity and strategic thinking. | 4.14 0.89 | Agree |
| contribute to the respondent to a sense of achievement when completing tasks. | 4.37 0.80 | Strongly Agree |
| Grand Mean | 4. | 27 |
| SD | 0. | 82 |
| Verbal Interpretation | Very | High |

As presented in table 3, there is a *very high* level of gamification features in terms of mechanism with the grand (M=4.27, SD=0.82). This implies that students perceived that the mechanism of the game directly contribute to the learning goals of the lesson.

Instructional games utilize game mechanics to drive student engagement, motivation, and advanced learning. These mechanics encourage exploration, problem-solving, and consistent engagement, turning passive information into an active experience. Intrinsic reward systems, such as points, progress through levels, digital badges, and leaderboards, contribute to a sense of accomplishment and encourage students to devote more time and effort to the learning process. Educational games also embed challenges that require critical thinking, promote skill development through practice, and encourage algorithmic thinking through rule-based systems and consequence analysis.

As supported by Adipat et al. (2021), one could argue that the benefits of incorporating game-based learning into the classroom greatly exceed its drawbacks. For games to be instructive and assist pupils, they need to concentrate on the material to highlight fictitious models, thus they should be founded on sound academic concepts and created by academics and educators. Teachers need to keep an eye on classes that use games to teach lessons, and make sure that when students lose a level or a game, they are not negatively impacted, but instead inspired to perform better in the future. Teachers are also responsible for teaching their pupils that winning a game isn't the end goal and that they shouldn't belittle their opponents who are defeated.

Another gamification features as follows, in Table 4, provided a detailed breakdown of the level of gamification features specifically in terms of their dynamics, this table likely presented the average mean (M) for the presence or also included a verbal interpretation.

Table 3 presents the Level of Gamification Features in terms of Dynamics.

 TABLE 3. Level of Gamification Features in terms of Dynamics

| STATEMENT | Mean | SD | Remarks |
|--|--------|--------|-------------------|
| The dynamics of the gamified learning materials | | | |
| keeps the respondent engaged with different experiences in the game and enhance his/her enjoyment of the game. | 4.33 (| 0.81 | Strongly Agree |
| shows the respondent an interaction between players within the game are stimulating and enjoyable. | 4.11 (| 0.84 | Agree |
| believes that the game has a significant impact on the respondent's decision-making. | 4.31 (| 0.83 | Strongly Agree |
| keep the respondent appreciate the diversity of strategies available within the game. | 4.32 (| 0.87 | Strongly Agree |
| shows the respondent a clearer game rules that are easy to understand, allowing for smooth gameplay. | 4.03 (| 0.99 | Agree |
| Grand Mean | | 4.2 | 22 |
| SD | | 0.8 | 38 |
| Verbal Interpretation | I | Very I | High |

As deliberately stated in Table 3, the analysis demonstrates a very high level of implementation of gamification aspects, particularly in terms of the underlying game dynamics, demonstrating a grand mean (M) of 4.22 with a standard deviation (SD) of 0.88. This statistically significant finding strongly urges that when educational games are thoughtfully designed and strategically varying skill levels present within a student population, the learning experience inherently becomes more inclusive.

By improving engagement, motivation, and an engaging learning environment, game dynamics help to improve students' educational encounter. These components foster critical thinking, cognitive skills, and helpful criticism as well as encourage Game-based learning increases knowledge retention, creates good emotional experiences, and helps to encourage group interactions. It helps to compile acquired ideas as well. Game-based learning's adaptability lets smart tailoring match various learning environments, thereby improving the accessibility, inclusive nature, and engaging

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quality of educational materials for a larger spectrum of students. Game dynamics help to create a more successful learning environment generally.

As supported by Alsawaeir (2018), many students who feel alienated by conventional teaching approaches can find some relief through the use of gamification in a pedagogical setting. The reduction in student motivation and engagement that the educational system is currently dealing with may be partially addressed by gamification.

As part of gamification features, in Table 4, provided a detailed breakdown of the level of gamification features specifically in terms of their characters, this table likely presented the average mean (M) for the presence or implementation of various game characters, along with their corresponding standard deviation (SD) indicating the consistency of their application and it also include a verbal interpretation.

Characters.

 TABLE 4. Level of Gamification Features in terms of Game Characters

 STATEMENT

| STATEMENT | Mean SD | Remarks |
|---|-----------|---------------------|
| The characters of the gamified learning materials | | |
| allow the respondent's choices regarding characters to influence the story, leading to unique outcomes based on my decisions. | 4.53 0.73 | Strongly Agree |
| keep the respondent believes that the visual design and art style of game characters significantly impact the enjoyment and engagement with the game. | 4.41 0.77 | , Strongly Agree |
| keep the respondent believes that iconic game characters can have a lasting impact on popular culture, influencing not just gaming but also movies, merchandise, and other forms of media. | 4.21 0.87 | Strongly Agree |
| shows the diversity of characters in games positively impacts the respondent's gaming experience and learning experience as well. | 4.15 0.97 | Agree |
| often find himself/herself relating to game characters on a personal level, which makes the gameplay more immersive to the respondent. | 4.27 0.88 | Strongly Agree |
| Grand Mean SD | | 4.31 0.86 |

| Verhal In | ternretation | |
|-----------|--------------|--|

As presented in table 4, there is a *very high* level of gamification features in terms of characters with the grand (M=4.31, SD=0.86). This means that students can feel more connected and relatable to well-designed game.

Game character influence interpretation and facilitate engagement within a game. Interactions with game characters might be driven by goals or empathy; goal-oriented interaction depends on the emotions produced by assessments of goal status, whereas characters foster empathetic interaction.

As cited by Focus on Learning Conference and Expo (2017), students are more comfortable and motivated to participate when they see characters with human-like traits, wants, and predictable behaviors.

Additionally, according to Pajanburee et al. (2024), the gaming approach's effectiveness depends on factors like age, cultural background, and game characters. Formative assessments in gaming contexts depend on game adaptation, which could compromise educational value. Character designers can make any character come to life by fusing storytelling with artistic ability, creating a more engaging gaming experience and a stronger emotional bond. According to experts, a video game's characters have a significant impact on its overall performance.

Level of Students' Digital Literacy

In this study, level of Students' Digital Literacy was described in terms of content creation, adaptability to new technology, and digital communication skill and was determined by the mean and standard deviation.

The Level of Students' Digital Literacy examined in terms of Content Creation were revealed in Table 5, which shows the average mean (M) score achieved by the students, alongside the standard deviation, and verbal interpretation. Content Creation.

 TABLE 5. Level of Students' Digital Literacy in terms of Content Creation

 STATEMENT
 Mean SD, Remarks

| SIMILMENT | Wiean | 1 50 | Remarks |
|--|-------|------|-------------------|
| In line with the following developed gamified materials | | | |
| the respondent is confident in producing digital content that is relevant to the subject matter (like presentation using PowerPoint, Canva, etc.). | 3.99 | 0.88 | Agree |
| the respondent is motivated to complete tasks and improve his/her persistence in content creation. | 4.27 | 0.79 | Strongly Agree |
| the respondent learns to set and achieve goals through structured challenges, which enhances his/her organizational and planning skills. | 4.01 | 0.94 | Agree |
| the respondent uses a variety of digital tools to create high-quality content (like PowerPoint presentation). | 3.98 | 0.90 | Agree |
| the respondent use multimedia elements to improve the material he/she created. | 4.09 | 0.85 | Agree |
| Grand Mean | | 4.0 | 07 |
| SD | | 0.0 | 88 |
| Verbal Interpretation | | Hi | øh |

As presented in table 5, there is a *high* level of students' digital literacy in terms of content creation with the grand (M=4.07 SD=0.88). This means that through a variety of digital media, including writing, audio, and video, students gain an important set of skills in content creation.

Content creation, primarily, is about the capacity to be active participants in the digital world by adding their own ideas and information in a digital form.

By fostering content creation skills, students at Los Baños National High School - Batong Malake, situated within the vibrant academic community of Los Baños, Laguna, can empower themselves to become active, engaged, and digitally literate individuals, well-prepared for the unique challenges and burgeoning opportunities of the 21st century, both within their local context and in the broader national and global landscape.

It supports the study by Lu, A., et al. (2021) that online discussion forums can be used to teach content creation, thereby increasing student participation and activity in a blended learning environment. The study also found that content creation increased students' performance and participation, leading to improved academic success and lifelong learning.

Table 6 focused on the Level of Students' Digital Literacy in terms of Adaptability to New Technology. This table

Very High

showed the average mean (M) score reached by the students, accompanying standard deviation (SD) provided a measure of how diverse these adaptation skills were within the student population, and also offered a verbal interpretation of these statistical values. An important indicator to the students' future readiness in a quickly evolving digital environment is provided by this specialized analysis of adaptability to new technology. Given the speed at which technology is developing both domestically and internationally, this flexibility is not only a desirable quality but also a critical requirement for students to succeed in their future academic endeavors, professional endeavors, and day-to-day lives. *Adaptability to New Technology*.

 TABLE 6. Level of Students' Digital Literacy in terms of Adaptability to New

 Technology

| STATEMENT | Mean SD | Remarks |
|--|-----------|-------------------|
| After the utilization of different gamified materials | | |
| the respondent quickly learns new digital tools and platforms and process quickly and effectively. | 4.17 0.88 | Agree |
| the respondent easily adapts to changes in educational technologies (like MS Office Word, PowerPoint, Excel). | 4.19 0.80 | Agree |
| the respondent successfully navigating technological changes builds confidence and resilience, making himself/herself better equipped to handle future challenges. | 3.94 1.01 | Agree |
| the respondent understands how to employ modern technology to complete tasks. | 4.11 0.85 | Agree |
| the respondent is willing to experiment with emerging instructional technologies (especially the PowerPoint Presentation). | 4.21 0.93 | Strongly Agree |
| Grand Mean | 4. | 13 |
| SD | 0. | 90 |
| Verbal Interpretation | Hi | gh |
| | | |

As presented in table 6, there is a *high* level of students' digital literacy in terms of adaptability to new technology with the grand (M=4.13 SD=0.90). This means that students' adaptability to new technology is a core component of digital literacy, empowering students to thrive in the 21st century and beyond.

Adaptability to new technology anchored to an individual's ability to learn, effectively use, and integrate digital tools, platforms, software, and technological advancements into their lives and learning processes, not just knowing how to use existing technology.

Adaptability to new technology in students extends beyond simply using a new app or website. It comprises a broader range of abilities and mindsets that enable individuals to confidently and effectively navigate the ever-changing digital ecosystem, which is especially essential for students.

According to Vila-Rosado, et. al. (2016) highlighted that educational technology aims to enhance teaching-learning experiences and provide quality education. Blended Learning combines online and face-to-face education, integrating technological advances. However, up to 60% of implementations fail. Technological adaptability is crucial for sustainability, user safety, long-term value, and functional efficiency. Table 7 focused on the Level of Students' Digital Literacy in terms of Digital Communication Skills. This table showed the average mean (M) score reached by the students, accompanying standard deviation (SD) provided a measure of how diverse these digital communication skills were within the student population, and also offered a verbal interpretation of these statistical values. A thorough picture of students' preparedness for successful online communication—a critical ability for their education and future digital engagement—is given by the analysis of digital communication skills. These abilities are now essential for negotiating the challenges of the twenty-first century in a world that is becoming more interconnected and where digital

Table 7 presents the Level of Students' Digital Literacy in terms of Digital Communication Skills.

 TABLE 7. Level of Students' Digital Literacy in terms of Digital

| Communication Skills | | | |
|---|------|------|-------------------|
| STATEMENT | Mean | SD | Remarks |
| Subsequent to the used of gamified learning materials | | | |
| the respondent can responsibly communicate effectively academically via digital channels (like Messenger, Facebook, Instagram, etc.). | 4.16 | 0.86 | Agree |
| the respondent adheres to digital etiquette (netiquette) when engaging in online communications. | 4.08 | 0.88 | Agree |
| the respondent develops a strong foundation in digital skills, including basic computer literacy, online communication, and information technology. | 3.98 | 0.94 | Agree |
| the respondent is capable of professionally responding to comments through digital communication methods. | 3.83 | 0.93 | Agree |
| the respondent can responsibly use internet search engine marketing (SEM) to get content to appear in search engine results (Chrome, Mozilla Firefox, Internet Explorer, MS Edge, etc.). | 4.30 | 0.87 | Strongly Agree |
| Grand Mean | | 4.0 |)7 |
| SD | | 0.9 | 03 |
| Verbal Interpretation | | Hi | zh |

As presented in table 7, there is a *high* level of students' digital literacy in terms of digital communication skill with the grand (M=4.07 SD=0.93). This means that students can participate in more in-depth and individualized learning experiences thanks to the wide range of instructional resources made accessible by digital tools.

Digital communication skills entail the capacity to communicate, interact, and collaborate with others using a wide range of digital technologies and platforms. This is more than just knowing how to send a message; it requires a comprehensive grasp of online communication in an educational and social environment.

According to Romi (2024), emphasized that students can learn and transmit knowledge by using an e-learning system. Knowledge, improve student-to-student contact, hold candid conversations, and obtain an equal standing, unlimited roundthe-clock response, current content, and cooperative group gaining knowledge. Additionally, according to the study of Urbanek, A., et. al. (2023) highlighted the impact of COVID-19 on digital communication skills in higher education. The study found a significant improvement in the quality of digital communication skills between students and teachers, particularly after the pandemic. The pandemic experience positively impacted the efficient use of digital education technologies, reducing inequalities and increasing inclusiveness in tertiary education. *Level of Students' Performance*

In this study, Students' Performance was described in terms of written test and was determined by frequency, percentage, mean and standard deviation.

TABLE 8. Level of Students' Performance in terms of Written Test

| | 0 | U | V |
|-------------------|-----------|------------|-------------------|
| Score | Frequency | Percentage | Descriptive Value |
| 41 - 50 | 28 | 19% | Excellent |
| 31 - 40 | 110 | 73% | Very Good |
| 21 - 30 | 12 | 8% | Good |
| 11 - 20 | 0 | 0 | Satisfactory |
| 1 - 10 | 0 | 0 | Needs Improvement |
| Mean Score | | 37.0. | 1 |
| SD | | 4.01 | |
| Descriptive Value | | Very Go | ood |
| | | | |

As presented in table 8, the students' performance in terms of written test is rated as "Very Good" with the grand (M=37.01 SD=4.01). This means that for a number of reasons that affect both short-term and long-term results, good test findings are quite important.

Well-written work is essential for academic and career success. It involves clear communication, logical arrangement, convincing arguments, and careful language tailoring. It reflects a writer's critical thinking, attention to detail, mastery of subject matter, and professionalism. These traits improve grades, contribute to career development, increase credibility, and equip individuals with necessary skills for negotiating challenging circumstances and reaching goals. Thus, wellwritten work is a key pillar of success.

According to the study of Duncan, E. (2018) found that students who overestimate their abilities tend to achieve better results on exams. The study also found that students who expected higher scores actually achieved similar academic results. Furthermore, the result showed that young women were more careful in their predictions than men, with more rational expectations and a faster learning process. The research confirmed that on average, all students, both boys and girls, are overwhelmingly inclined to overestimate their abilities, but with each passing exam, their predictions become more accurate.

Significant Effect on the Use of Gamification Features on Students' Digital Literacy

To test the significant effect on the use of Gamification Features on Students' Digital Literacy data were treated statistically using Minitab 14 using Regression Analysis. The major findings were presented in the following table.

Table 9 present the Test of Significant Effect on the use of Gamification Features on Students' Digital Literacy.

Materials significantly improve students' digital literacy skills. The statistical outcomes include t-values, p-values, and sample size (N=150). The results showed that strategic integration of gamification features enhances students' abilities to navigate, evaluate, and utilize digital technologies effectively for learning and beyond. This indicates that adding gamification features to educational resources is essential for successful

learning. With the notable improvements in students' digital literacy skills—which include content creation, adaptability to new technology, and digital communication skills—the thoughtful incorporation of game-like components seems to be a potent teaching strategy.

 TABLE 9. Test of Effect on the Use of Gamification Features on Students'

 Digital Literacy

| Students' Digital Literacy (DV) | | | | |
|---------------------------------|----------|-----------------|---------------|--|
| Gamification | Content | Adaptability to | Digital | |
| Features (IV) | Creation | New Technology | Communication | |
| | | | Skill | |
| Components: | | | | |
| t-value | 6.60 | 5.97 | 3.87 | |
| p-value | 0.000* | 0.000* | 0.000* | |
| Ν | 150 | 150 | 150 | |
| Mechanism: | | | | |
| t-value | 7.27 | 7.26 | 4.07 | |
| p-value | 0.000* | 0.000* | 0.000* | |
| N | 150 | 150 | 150 | |
| Dynamics: | | | | |
| t-value | 6.40 | 8.38 | 4.03 | |
| p-value | 0.000* | 0.000* | 0.000* | |
| N | 150 | 150 | 150 | |
| Character: | | | | |
| t-value | 8.32 | 10.13 | 5.49 | |
| p-value | 0.000* | 0.000* | 0.000* | |
| Ν | 150 | 150 | 150 | |
| 17 | | | | |

Note: * *p* < .05

The results presented in Table 9 strongly indicate that the various dimensions of gamification features have a statistically *significant positive effect* on all measured aspects of students' digital literacy among the 150 students in this study conducted at Los Baños NHS - Batong Malake. This emphasized that introducing well-designed gamification components into learning materials and activities can be a successful method for increasing students' digital literacy skills in this local educational context. The strength of these effects, as indicated by the t-values, differs across the different dimensions, demonstrating that some features of gamification may have a more significant effect on specific digital literacy skills than others. For instance, game characters tend to have a very strong positive affect on adaption to new technology.

As discussed by Zheng (2023), emphasized the impact of digital game-based learning (DGBL) on students' learning motivations, engagement, and motivation and intrinsic motivation, with in-game rewards promoting intrinsic motivation.

Significant Effect on the Use of Gamification Features on Students' Performance

To test the significant effect on the use of gamification features on students' performance data were treated statistically using Minitab 14 using Regression Analysis. The major findings were presented in the following table.

Shown in table 10 is the significant effect of the use of gamification features on students' performance. The results include Regression Analysis (t-values), p-values, and sample size (N=150) for each relationship of gamification features had a statistically significant effect on their performance in the written test. This means that, in this unique setting and with this particular measure of student performance, the

introduction and execution of these gamification features did not lead to a statistically significant effect in students' scores on the written evaluation.

TABLE 10. Test of Effect on the Use of Gamification Features on Students' Performance

| Gamification Features (IV) | Students' Performance (DV) Written Test | | |
|----------------------------|--|--|--|
| Components: | | | |
| t-value | 0.57 | | |
| p-value | 0.572 | | |
| Ñ | 150 | | |
| Mechanism: | | | |
| t-value | 1.82 | | |
| p-value | 0.071 | | |
| Ñ | 150 | | |
| Dynamics: | | | |
| t-value | 1.06 | | |
| p-value | 0.293 | | |
| Ñ | 150 | | |
| Character: | | | |
| t-value | 1.72 | | |
| p-value | 0.088 | | |
| Ň | 150 | | |

Note: * *p* < .05

It's important to realize that this does not necessarily indicate that gamified strathegy has no effect on learning. It could be that there're certain factors that the researcher thinks affects the result of the study, initially, lack of ICT facilities and equipment have huge impact to the study, followed by changes of the students' schedule from 50 minutes per subject to 30 minutes per subject due to sudden changes of the weather, followed by some sections that the researcher handles this school year have a schedule of twice-a-week meetings, which is less than half of the respondents, another factor that the researcher thinks affects the result is the gamified material itself because it is made on the PowerPoint Presentation and because of that it is considered as a one-time game and there is no way on saving the progress of the game unlike other game that the students played each and every single day.

According to Madhu and Batthacharrya (2023) highlight that learning styles are influenced by an individual's approach to learning, understanding, and retention of information. Recognizing and addressing these styles helps educators create a more inclusive and effective learning environment.

IV. CONCLUSION AND RECOMMENDATIONS

In light of the results of the study, the following conclusions are concluded:

The study found that there was a significant effect of the use of gamification features on students' digital literacy. Thus, the null hypothesis was rejected. Therefore, this means that by integrating gamified strategy in teaching enhances students' proficiency in navigating, evaluating, and effectively using digital technologies for learning and beyond.

gamification features on students' performance. Thus, the result failed to reject the null hypothesis. Therefore, this means that the implementation of gamified strategy in a specific academic setting did not significantly impact students' written test scores. The researcher came up with the following recommendations parallel to the conclusions made in the study:

The Department of Education could provide more ICT facilities and technology to be utilized by teachers as instructional materials tailored to the requirements and interests of 21st century learners.

School principals are encouraged to motivate teachers to attend seminars on ICT integration in various subject areas and to maximize the use of technology in the teachinglearning process.

TLE-ICT Teachers are encouraged to develop an interactive computer-based learning system similar to gamified straTHEgy for it can help the students to be well engaged in the subjects in all grade level and for them to become more familiar in using computer and other ICT equipment since the study found that there is no significant effect of the use of the gamification features on student's performance.

Future researchers are strongly encouraged to have an innovation in Gamified StraTHEgy with more facility and technology and have the capability to better increase the students' performance and students' ability and

Parents are strongly encouraged to actively teach, constantly guide, and frequently remind children about the appropriate and responsible use of technology. In order to enable children to fully utilize the enormous potential of technology, particularly for educational purposes, this proactive parental involvement is essential. Parents can help their children navigate the digital world safely and effectively by setting clear guidelines, encouraging critical thinking about online content, and placing a strong emphasis on ethical digital citizenship.

Students should actively engage with the gamified learning materials, focusing on the game-like elements, the opportunities for skill development in content creation, adaptability, and digital communication, and the inherent motivation and engagement that gamification provides. By doing so, they can significantly enhance their digital literacy skills, preparing them for the demands of the future.

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