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Effects of Gamification in the Learning Performance of the Students

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Abstract

Aim: This study compared the effects of gamification on the learning performance of the college students which will serve as a basis for practitioners and app developers to improve online classroom learning strategy.

Methodology: This study used a descriptive, correlational design using survey to determine the relationship between the variables. It follows a quasi-experimental design, determining learning results between two sections that are subjected to gamified and non-gamified lessons. Fifty participants from similar curriculum and teacher joined the experiment.

Results: Majority of the respondents strongly agreed that gamification positively affect student's competence as the highest, while autonomy and relatedness followed. Accordingly, the survey revealed also that students in the gamified online class were more competent than the non-gamified flipped class. The data show that the mean scores of most items of students' competence beliefs are higher than the non-gamified online class. Students in the gamified online class showed more competence in learning and mastering new skills either within the class hours or on their own. They are also more capable of using technology and are able to ask critical questions and produce critical thinking.

Conclusion: The students in the gamified class strongly agreed on its effects with regard to competence, autonomy and relatedness while the non-gamified class agreed only. This further confirms that students taught with the application showed significant improvement in their grades performance. Hence, there is significant relationship between the effects of gamification and the student performance. Difference of responses exist when the effects of gamification is grouped according to the two types of participants. Therefore, the researchers propose some strategies to enhance the effects of gamification to one college in a Batangas City university.

Keywords: autonomy, competence, gamification, relatedness,

INTRODUCTION

Gamification is the application of technical game elements such as scoring, competing, outranking, game mechanics to non-game activities to engage and entice prospect users or buyers to a product or service. This integrated design method to entertain as form of fishing for people's attention and participation is not new, neither is the term and its methods. Gamification has long been with users in many industries like a membership rewards system to some favorite shopping centers, getting rewarded with star or crocodile stamps by primary school teachers, or working hard to earn ranks or places in a roster of long-term awards. Hence, gamification is designed to attract people into participating the scheme that is gamified to carry out purpose.

Gamification can be mistaken for mere games facilitated in a non-game activity. For example, Mario Brothers, a game developed by Nintendo was primarily created and produced for fun and recreation; Frozen Throne is a 3D role playing game that is continuously updated for leisure and fun together with more progressive mobile games; team building activities are acts of gamifying when gamification in its technical definition is different such as knowledge acquisition and behavior change toward an intended purpose through application of game element. Mechanisms like combat, content unlocking, gifting, boss fights, quests, social graphs, certificates and memes also known as 'elements' in gamification stimulate learners to achieve greater goal orientation by increasing their persistence, learning by



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repetition, engaging in collaboration and evoking fun and friendly competition with peers (Ding, 2019, as cited in Zainuddin, et al., 2020).

Gamifying common activities can flip the problem that online learning always tries to engage and challenge itself—the deteriorating attention span of learners. When a full scheme to transition and shift to online from traditional classroom setup was enforced, this has become one of the priorities of teachers when designing their course strategies. Gamification in education has existed for innumerable ways to attract students into learning while becoming competitive by not only emphasizing the matter of winning for students but by enticing them to the possible rewards of learning that lie in the process of the gamified design. The ranking of honor rolls from the class valedictorian to the honorable mentions can be considered a gamified design to badger students' achievements by labeling them on ranks that determine their grade point averages at the end of a 4-year series of educational level. These common scenarios are evidence of how gamification is applied in education.

This study is built on the theory of psychologists Edward Deci and Richard Ryan who pioneered in the mid 1980s the Self-Determination Theory (SDT) which posits the determinant to measure the effects of gamification piloted in the study about students' learning performance and perceived motivation in gamified flipped-class instruction by Zainuddin (2018) at the University of Hong Kong. It measured students' responses from gamified flipped classrooms through intrinsic motivation—"a motivational theory that offers provisions that improve a student's sense of autonomy, competence, and relatedness, which is supported by the internal factor of motivation or the so-called intrinsic motivation." His study defines every student's main intrinsic which are: autonomy, the ability to perform a task independently and with only limited guidance from advisers of instructors; competence, perceived by the student's ability to compete and master contents efficiently; and relatedness, perceived as students' socialization manifestation with their classroom peers during or outside their learning activities.

At present, the application of gamification into education curriculum is seen as dire helpful to the transition of schools into online and remote learning. While lectures can be carried out through online video conferences, the need to maintain engagement in class between student and teacher is more challenging. It is in the nature of the digital self that it is multipliable, helping students to multi-task while listening to the lessons. Thus, gamifying online learning materials can bolster student attentiveness and other behaviors that accompany it.

In this regard, the researchers find this topic full of opportunities in the season of transition from conventional classroom teaching setup to paving way and embracing the highly technical education platforms. This study is envisioned to find practices that can be incorporated as enhancement of online classroom learning that will engage more learners and change attitudes toward the rise of online methods.

Objectives

This paper generally aimed to determine the effects of gamification to college courses, and use them as basis for enhancement of online classroom learning; more specifically, by probing on the following:

1. What are the compared effects of gamification in terms of:
 - 1.1. Competence;
 - 1.2. Autonomy; and
 - 1.3. Relatedness?
2. What is the learning performance of the students after gamification?
3. How do the responses differ when grouped according to the types of participants?
4. What is the relationship between effects of gamification and performance of students?
5. What strategies can be proposed to enhance the effects of gamification on student's online classroom learning?

Hypothesis

Given the stated research problems, the following hypotheses were tested on 0.05 level of significance:

Hypothesis 1: There is no difference of responses on effects of gamification when grouped according to type of participant.

Hypothesis 2: There is no significant relationship between the effects of gamification and performance of students.



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METHODS

Research Design

A quasi-experimental research design is employed in devising this study. To determine and compare the effects of gamification on the performance of the students based on their competence, autonomy, and relatedness, as well as students' learning performance in a gamified and non-gamified online classroom set-up, this research design follows Paul Price's definition of these types of research. "Quasi-experimental research involves the manipulation of an independent variable without the random assignment of participants to conditions or orders of conditions."

Population and Sampling

The 50 respondents were the hundred percent enrollees taken from two sections in one private university under the course Art Appreciation, with similar curriculum taught by similar instructor as the researcher¹. The two groups of respondents both belong to the Arts and Sciences College who were students for the 1st Semester in the SY 2020. Primarily, all of them had completed the course via full online learning. The 25 students belonging to one section were subjected to gamification on their learning activities while the other 25 students were not.

Instrument

The researchers adopted the questionnaire from the study "Students' learning performance and perceived motivation in gamified flipped-class instruction" by Zamzami Zainuddin (2018) in measuring the intrinsic motivation of students in the gamified online classroom. The questionnaire consists of 15 questions, 5 items designed to evaluate a student's perceived autonomy, 5 for competence, and 5 for relatedness. The 4-point Likert scale which was used ranged from strongly agree (4) the highest, to strongly disagree (1), the lowest.

In order to evaluate students' learning outcomes, their performance in gamified lessons was measured through using an assessment process and grades received were interpreted from poor to excellent.

Data Collection

Both gamified online class and non-gamified online class were taught in a full term's duration with the same content, with researcher 1 as the instructor. The gamified online class was selected as the experimental group, while the non-gamified online class was the control group. Students of the gamified online class learned by watching educational video lectures through distant learning and later reconvened in an online classroom, through Microsoft Teams particularly, to participate in a virtual classroom activity, group discussion, and student presentations. Besides, outside the class, the students in the gamified flipped classroom were also required to answer formative assessment on the LMS gamification system, related to as the post-experiment assessment. Through this online gamification system, the students were able to compete to score points and earn badges that were announced as "convertible" to additional points in the major exams. In designing the online classroom setup, the researcher used a free Moodle Cloud Site (<https://moodlecloud.com/app/en/login>) as recommended by the university LMS administrator, which can directly embed other websites inside online rooms. This enabled the instructor to design a quiz easily, embed leaderboards through Leaderboard (<https://aleaderboard.com>), and directly create badges and upload them through DesignEvo (<https://www.designevo.com>). The quiz was not only based on texts, but also pictures and videos.

A leaderboard was also provided in this platform to motivate the students to get better results and help them track their progress. Further, the instruction given to a non-gamified online class was quite similar to that of the gamified class, but without the gamification elements such as leaderboards and badges. The students in this control group were only required to watch the video lectures, attend the online lecture through Microsoft Teams and answer the assessment through the Moodle room.

Treatment of Data

The information gathered by the researchers was tallied, encoded, and tabulated. Utilized in analyzing and interpreting the data were distinct measurable devices comprised of frequency distribution for students' learning performance, weighted mean for effects of gamification and Analysis of Variance and independent sample test for comparing and testing the comparison of responses.

Ethical Consideration

To uphold ethical accountability, the researchers were guided by LPU Ethics Committee, ensuring that it is the voluntary act of the respondents to participate in this research as primary data source. Participants agreed through the



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researcher's consent request presented in the forms. To avoid the use of offensive, discriminatory or other unacceptable language, questionnaires were reviewed and validated attentively. Respondents' names on the questionnaires were asked but were not required. For participants who opted to provide full personal information, compliance to the data privacy act was assured, detailing the lawful rights for anonymity and privacy and that all data will be used solely for the research.

RESULTS and DISCUSSION

Table 1
Compared Effects of Gamification in terms of Competence

Indicators	Gamified		Non-Gamified		Over-all		R
	WM	VI	WM	VI	WM	VI	
I was...							
1. better than others in the class performance.	3.44	A	2.80	A	3.12	A	3
2. able to learn interesting new skills in this class.	3.80	SA	2.68	A	3.24	A	2
3. fully capable of using technology in this class.	3.84	SA	2.76	A	3.30	A	1
4. able to ask critical questions.	3.64	SA	2.44	D	3.04	A	4.5
5. able to think critically.	3.72	SA	2.36	D	3.04	A	4.5
Composite Mean	3.69	SA	2.61	A	3.15	A	

3.50 – 4.00 = Strongly Agree (SA); 2.50 – 3.49 = Agree (A); 1.50 – 2.49 = Disagree (D); 1.00 – 1.49 = Strongly Disagree (SD)

Table 1 shows the perceived level of competence of the gamified and non-gamified classes wherein the prior section produced better results with a composite mean of 3.69, indicating strongly agree, than the latter with a composite mean of 2.61, indicating agree only. Over-all, the indicators for both classes yield high means, ranging from 3.04-3.30, and a composite mean of 3.15.

It is evident that the highest indicator for both gamified and non-gamified classes is students' capability of using technology in the class with the prior section assessed with 3.84 weighted mean, indicating strongly agree, compared to the latter section's 2.80 weighted mean, indicated as agree. Based on the responses, it can be noted that there is a feel of self-confidence on their knowledge and skills of using instructor - led technology; hence, very convinced that he or she performs better in class than other classmates. As Giesbers et al. (Zainuddin et al., 2019) premised, students who are motivated would be more confident to engage in class activities and are able to better understand the course concepts; hence, their competence improve. This is shown by how students master their tasks making lucky guesses or avoiding errors.

Second in the over-all, the gamified class strongly agreed that they are able to learn interesting new skills in the class with a weighted mean of 3.80, while the non-gamified class only agree according to their weighted mean of responses, 2.68. The students like the course content presentation with an easy access to the dashboard having the learning module with direction and easy to complete assignments with due dates. Both groups can navigate and push themselves to try new things that will help them learn. The Learning Management System have functions like grading and learning materials on different pages, and, in contrast, the gamified dashboard allows students to visit one location for multiple tasks.

Third in the over-all list, students from both sections also agree to the indicator that they perceive themselves as better than others in the class performance. The gamified class showed agreement through a weighted mean of 3.44 while the non-gamified class through 2.80 weighted mean.

The fourth and fifth indicators listed equally and least in the over-all ranking of level of competence in both sections, in which the gamified class strongly agrees that they can ask critical questions and think critically, through a weighted mean of 3.64 and 3.72 respectively, while the non-gamified class disagrees on both indicators with weighted means of 2.44 and 2.36 respectively. Because the students are able to think judiciously, it follows that they can ask critical questions. They freely discuss among their classmates how they did it, why they were able to decide so they



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can strategize and advance and happily, proudly claim they did the work themselves which the non-gamified group failed to have practiced. Based on this finding, it can be assumed that the instruction provided in the experimental group, such as a small group discussion, presentation, and questioning strengthened their motivation to think analytically. The controlled group, though teacher-led lacked their motivation to even initiate or innovate actions because they feel what they are doing was just enough.

The findings support the previous study conducted by Zainuddin (2020) who found that students in a gamified class setup have the desire to feel effective in attaining valued outcomes with perceived competence providing students with knowledge, positive attitudes, and self-confidence to achieve academic success. In this study, students felt confident to claim themselves as lifelong learners, information and knowledge seekers, self-directed learners, and critical thinkers.

Table 2
Compared Effects of Gamification in terms of Autonomy

Indicators	Gamified		Non-gamified		Over-all		R
	WM	VI	WM	VI	WM	VI	
1. I felt free to express my ideas and opinions in the group work.	3.68	SA	2.32	D	3.00	A	5
2. Outside of the online classroom, I was able to control my learning environment by working when it was convenient for me.	3.48	A	2.84	A	3.16	A	3
3. Outside of the class hours, I enjoyed the freedom to do the work whenever I was able.	3.24	A	3.12	A	3.18	A	2
4. Outside of the class hours, I was able to control my own learning speed.	3.56	SA	2.68	A	3.12	A	4
5. Outside of the class, I was able to manage my own learning time.	3.60	SA	2.84	A	3.22	A	1
Composite Mean	3.51	SA	2.76	A	3.14	A	

3.50 – 4.00 = Strongly Agree (SA); 2.50 – 3.49 = Agree (A); 1.50 – 2.49 = Disagree (D); 1.00 – 1.49 = Strongly Disagree (SD)

Table 2 presents the autonomy of the gamified and non-gamified classes wherein the prior section again produced better results with a composite mean of 3.51, indicating strongly agree, than the latter section that produced a composite mean of 2.76, indicating agree only. Over-all, the indicators for both classes yield high means, ranging from 3.00-3.22, and a composite mean of 3.14 indicating agree.

On top of all indicators, outside the class, the student was able to manage own learning time was strongly agreed by the gamified class with a weighted mean of 3.60, versus the non-gamified class' 2.84 weighted mean, indicating agree also. However, taken separately, the experimental or gamified group considered highest or they have strongly agreed on the indicator where they feel free to express their ideas and opinions, confirming the result of Craud (2018) indicating that gamification supports the emergence of learner autonomy; meaning he students take control of the learning activity and create their own learning paths.

Following is outside the class hours, the student enjoyed the freedom to do the work whenever they were able which resulted agree remarks only from both classes. Gamified class received weighted mean of 3.24 over the non-gamified class' 3.12. Because LMS is always available, students can access their gamified lessons everywhere and everytime, giving them flexibility and enjoyment.



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Third, both classes again agreed that outside the online classroom, the student was able to control his or her learning environment by working when it was convenient. The gamified class got a 3.48 weighted mean while the non-gamified class has a 2.84 weighted mean.

Ranking fourth is student's able to control own learning speed. The gamified class responded with a 3.56 weighted mean, indicating strongly agree, while the non-gamified class responded with a 2.68 weighted mean, indicating agree.

The last item, feeling free to express ideas and opinions in the group work garnered different responses. The gamified class strongly agreed in a still quite high 3.68 weighted mean response while the non-gamified class disagreed with a 2.32 weighted mean response only, showing a far difference in their interpretation.

The responses differ unlikely, with gamified elements in a learning setup, activities are mostly devised to be self-learned by students. As stated by Ansari and Khan (2020), online social media used for collaborative learning had a significant impact on interactivity with peers, teachers and on-line knowledge sharing behavior. This means that e-learning improves institutions' abilities to reach more students and changing student markets as well as provide access to educational activities and limitless resources at anytime, anywhere, and at any pace.

On the other hand, with non-gamified online class, lessons are designed to be fed on students through lectures and assessments only, thus, not giving the students their freedom to choose their own pace of learning. According to Puren (2001, as cited in Pouzergues, 2022), in a differentiated pedagogy, "students, individually or in groups, are working at a given time on different tasks" but the teacher is still directing the learning by assigning different tasks to different students. This means that in a differentiated pedagogy, the control remains mainly in the hands of the teacher who decides what individual students will work on.

Table 3
Compared Effects of Gamification in terms of Relatedness

Indicators	Gamified		Non-gamified		Over-all		R
	WM	VI	WM	VI	WM	VI	
1. I was able to interact with peers during and after class hours.	3.60	SA	2.36	D	2.98	A	3
2. I had more opportunity to be close to others while discussing in the class was convenient for me.	3.52	SA	2.48	D	3.00	A	2
3. I really like the people I work with.	3.88	SA	2.60	A	3.24	A	1
4. I really like working in-class discussion.	3.60	SA	2.24	D	2.92	A	4.5
5. Working in a group helps stimulate critical thinking.	3.60	SA	2.24	D	2.92	A	4.5
Composite Mean	3.64	SA	2.38	D	3.01	A	

3.50 – 4.00 = Strongly Agree (SA); 2.50 – 3.49 = Agree (A); 1.50 – 2.49 = Disagree (D); 1.00 – 1.49 = Strongly Disagree (SD)

Table 3 indicates the gamification effects in terms of relatedness where the gamified class yielded better and higher results from the non-gamified class. With a composite mean of 3.64, indicating strongly agree, the first mentioned section responded in an obvious gap than the latter section with a composite mean of 2.38, indicating disagreement. Over-all, the indicators for both classes are still positive when computed in rows, ranging from 2.92-3.24, with a composite mean of 3.01, indicating agreement.

Topping the list, really liking the people or classmates they work with is strongly agreed by the gamified class with a 3.88 weighted mean. Based on an observation, what other people say, do or think really matters to these students. Touting, bragging and reactions make them more excited and energetic. They know each other and can also monitor their progress, hence they become socially aware. Those actions became the engine behind the themes like mentorship, competition, envy, group quests, social treasures and companionship (Yu-kai Chou, 2019).



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On the other hand, the non-gamified class only agreed with a 2.60 weighted mean. Perhaps, they get used to the traditional pacing of their lectures, assignment, discussion, quiz routine and just keep on with the flow. They are no longer collaborating or if there are instances, very rarely. Relatedness might be between the teacher and the student or sometimes with classmates.

Secondly, the indicator having more opportunity to be close to others while discussing conveniently in the class garnered different responses. The gamified class responded with a 3.52 weighted mean, indicating strongly agree, while the non-gamified class responded with a 2.48 weighted mean, indicating disagree, quite a distant in analysis. It was observed that when there are groupings, students in the gamified class even use other chat group platforms for meetings like zoom and google meet. On the other hand, the other group just rely on how the teacher leads them to accomplish the activity.

While the participants strongly agreed that they are able to interact with peers during and after class hours with a 3.60 weighted mean, the non-gamified class registered a slightly lower 2.98 weighted mean indicating disagreement. That could mean giving or getting feedback, telling stories, sharing the feeling while accomplishing the game made them more socially related with other people though they were online. That feeling was missed by the control group as they just end the course session and went back with it the next meeting. As emphasized in Deci's SDT, there is psychological need for competence, autonomy and relatedness where enriching learning environment with game design element potentially affect the learning outcomes of the students. Researchers have highlighted the role of feedback as one among the most powerful factor in the relationship between the educational intervention and learning in general (Hattie & Teimperley, 2007, as cited in Sailer & Hommer, 2019). Participants in a game condition with avatars share meaningful stories, and teammates experience higher levels of social relatedness, and need satisfaction than participants who do not experience that.

Tied at fourth, the weighted means from the last two indicators produced identical results for both gamified and non-gamified classes. I really like working in-class discussion and working in a group helps stimulate critical thinking garnered 3.60 weighted mean from the gamified class, while the non-gamified class produced 2.24 weighted mean, indicating disagree.

These results implied that the students in the experimental group were able to interact with peers in the online classroom and even outside the class hours. Whereas students in the control group can imply that they have a difficulty to interact with peers after the class hours due to a limited technological platform used for online interaction such as breakout rooms in MS Teams.

Table 4
Effects of Gamification

Indicators	Gamified		Non-gamified		Over-all		
	WM	VI	WM	VI	WM	VI	R
1. Competence	3.69	SA	2.61	A	3.15	A	1
2. Autonomy	3.51	SA	2.76	A	3.14	A	2
3. Relatedness	3.64	SA	2.38	D	3.01	A	3
Composite Mean	3.61	SA	2.58	A	3.10	A	

3.50 – 4.00 = Strongly Agree (SA); 2.50 – 3.49 = Agree (A); 1.50 – 2.49 = Disagree (D); 1.00 – 1.49 = Strongly Disagree (SD)

Table 4 summarizes the computed results of effects in terms of competence, autonomy, and relatedness for gamified and non-gamified online classrooms. From all indicators, the gamified online classrooms produced higher results compared to the non-gamified online classroom with a composite mean of 3.61, indicating Strongly Agree, versus 2.58, indicating Agree, all respectively.

Over-all, competence topped the other indicators while autonomy and relatedness followed. Accordingly, the survey revealed that students in the gamified online class were more competent. The fact shows that the mean scores of most items of students' competence are higher than that of the non-gamified online class. Students in the gamified online class showed more learning and mastering new skills either within the class hours or on their own. They are also more capable of using technology on their own and are able to ask critical questions and produce critical thinking. After the course, the students in the experimental group showed higher levels of competence, autonomy and relatedness than the control group. One study that supports this finding was done by Martinez et al. (2023) who



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investigated the effects of gamification on the motivation and basic psychological needs of secondary school physical education students. They found that a gamified intervention enhances the satisfaction of the basic psychological needs, increases intrinsic motivation in secondary education students.

Table 5
Student's Learning Performance through an Assessment Process

	Gamified		Non-Gamified	
	F	%	F	%
Excellent	8	32.00	4	16.00
Outstanding	5	20.00	4	16.00
Superior	7	28.00	2	08.00
Very Good	1	04.00	2	08.00
Good	-	-	1	04.00
Satisfactory	2	08.00	2	08.00
Fairly Satisfactory	-	-	2	08.00
Fair	1	04.00	1	04.00
Poor	-	-	6	24.00
Failed	1	04.00	1	04.00

99 – 100 = Excellent; 96 – 98 = Outstanding; 93 – 95 = Superior; 90 – 92 = Very Good; 87 – 89 = Good; 84 – 86 = Satisfactory; 81 – 83 = Fairly Satisfactory; 78 – 80 = Fair; 75 – 77 = Poor; below 75 = Failed

Table 5 shows the frequency distribution of the results of an assessment process that was taken by both gamified and non-gamified classes. From both classes having 25 students, the gamified online classroom resulted to more Very Good to Excellent achieving takers with 84% of the class compared to non-gamified online classroom's 52% only. The remaining 16% for the gamified online classroom is distributed to 8% of the class attaining Fairly Satisfactory, 4% attaining Fair, and the other 4% attaining Failed. For the non-gamified classroom, the remaining 48% of the class got remarks ranging from Failed to Satisfactory, with 24% getting Poor, 8% getting Satisfactory, another eight for Fairly Satisfactory, 4% for Poor, and the last 4% getting Failed.

Significantly, the findings point to a positive effect of gamification to the learning performance of the students. This finding is confirmed by Pham, et. al. in 2021 concluding that students after learning with the application integrated in the program, both their academic performance and learning autonomy posted a remarkable improvement compared to those in the traditional class.

Table 6
Comparison of Responses when grouped according to type of Participants

	group	Mean	t-value	p-value	Interpretation
competence	Gamified	3.69	11.55	0.000	Highly Significant
	Non-gamified	2.61			
autonomy	Gamified	3.51	6.18	0.000	Highly Significant
	Non-gamified	2.76			
relatedness	Gamified	3.64	12.32	0.000	Highly Significant
	Non-gamified	2.38			

Legend: Significant at p-value < 0.05



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Table 6 displays the comparison of responses on the levels of competence, autonomy and relatedness when grouped according to types of participants. It was observed that the computed p-values were all less than 0.05 alpha level. This means that a significant difference exists and based on the test conducted, it was found out that students from the gamified online classroom have higher assessment on competence, autonomy, and relatedness than the students from the non-gamified online classroom.

Table 7
Relationship between Effects of Gamification and Performance of Students

	group	Mean	t-value	p-value	Interpretation
performance	gamified	94.36			
	non gamified	87.96	2.262	0.012	Significant

Legend: Significant at p-value < 0.05

Table 7 shows the relationship between effects of gamification and performance of students. It was observed that there was a significant difference found since the obtained p-value of 0.012 was less than 0.05 alpha level. Based on the result, it was found out that the performance of those who used gamified online class was better than those who underwent the non-gamified online class.

Significantly, it was evident that the results for the compared effects of gamification in all three domains: competence, autonomy and relatedness pointed in favor to the experimental group; therefore, the more a class uses gamification, the better will be the learning performance of the students have. This supports the findings of Ortiz in 2020 saying that there is a significant improvement in learning performance in the gamified condition or environment compared to a control group.

Table 8
Proposed Strategies to Strengthen the Effects of Gamification on Online Classroom Learning

Key Result Area	Strategies	Person/s Responsible	Success Indicator
1. Relatedness -The student really likes working in-class discussion Objective: to increase student's interest in joining class discussion	Enforce and encourage in-class discussions, consultations and interventions between students and teachers, through the use of break-out rooms, response-mediating apps, and more alike.	Department Chairs Teachers students	85% of students have increased interest in joining class discussion particularly in groups
-Working in a group helps stimulate critical thinking.	Avoid spoonfeeding of lessons and encourage group activities through video conferencing apps, and team building apps	Department Chairs Teachers	85% of the students have gained autonomy in expressing ideas and opinions in group work
2. Autonomy -Feeling free to express ideas and opinions in the group work.	Align group activities with creative outputs to enforce open-mindedness and critical-thinking, thus,	Teachers students	



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Objective: to improve student's self confidence in expressing ideas and opinions in group work

3. Competence

-student is able to ask critical questions.

Objective: to encourage students to post critical questions

The students is able to think critically.

making use of applications such as Canva, Slides, and more that enable collaborative creative works too

Encourage discourses with students and utilize the old philosophical method of Plato's dialogue to deduce details and foster critical mindset through video conferencing applications

Avoid spoonfeeding lectures and encouraging ice-breaker questions from chunked lectures that can improve students critical-thinking skills and attention span

Enable third-party apps to install with school-based learning management system to enjoy more online learning features

Teachers to students

Department chair

Teacher

Learning Management System Office

85% of the students are encouraged to post critical questions leading to productive discourses

Conclusion

Based on the findings, the following generalizations are drawn:

1. Majority of the respondents agreed that gamification affects the student learning motivation in terms of competence as the highest, followed by autonomy then relatedness as the lowest.
2. Most of the respondents in a gamified classroom performed better with superior to excellent marks than the non-gamified students who received satisfactory to failed grades as performance at the end of the course.
3. There is highly significant difference of responses on effects of gamification in terms of competence, autonomy and relatedness when grouped according to type of participants.
4. There is a significant relationship between gamification and the learning performance of the students; those who experienced gamified online class performed better than those who underwent the non-gamified online class.
5. The researcher proposed strategies to enhance the effects of gamification to online learning.



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Recommendations

The researchers hence forward the following recommendations:

1. The university colleges through the deans may continuously encourage the faculty members in using gamification as strategy for learning engagement.
2. The Management Information System Office may continuously provide trainings to fully capacitate faculty members in using different applications embedded in LMS for students' maximum use.
3. The respective department chairs may continue to implement peer tutorials to learn and discover more open tools and resources for classroom gamification engagement.
4. The administration may consider the proposed strategies for discussion, implementation and evaluation thereafter.
5. Future researchers may conduct similar topic using a larger set of samples specifically from other colleges and courses to validate the present finding.

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