

INCREASING LEARNERS' PERFORMANCE AND INTRINSIC MOTIVATION USING GAMIFIED INSTRUCTIONAL MATERIALS: THE ARCS MODEL APPROACH

Rocel M. Alcasoda¹ & Jennylyn M. Balaoro²

^{1,2} Student, College of Education, Polytechnic University of the Philippines Quezon City Branch

ABSTRACT

The two-year mark of the pandemic has brought an enormous education crisis caused by the sudden shift of learning delivery from face-to-face to online learning modality. Educators are now facing a challenge to utilize effective teaching strategies that can better hold attention, build up motivation, and can increase positive learners' performance while integrating technology. The researchers of this study focus on the potential of Gamified Instructional Materials (GIM) in increasing the academic performance and intrinsic motivation of the learners. This quasi-experimental study attempts to evaluate the effectiveness of GIM through the actual class intervention and through the reduced and modified Instructional Materials Motivation Survey (IMMS) containing indicators of Attention, Relevance, Confidence, and Satisfaction (ARCS) Model. The results revealed that ARCS Model integration through IMMS got an overall mean score of ($M=3.42$). This further implies that GIM can be used as an innovative tool to engage and motivate students while learning. Moreover, the results of Paired Samples T-Test revealed that during the pre-test, the control-experimental group scored ($M=1.20$, $SD=1.12$, $p=0.000$) while during the post-test, the paired samples scored ($M=1.0$, $SD=1.32$, $p=0.000$) which imply that there is a statistical difference between the pre-post test scores of control-experimental groups. Further, the analysis of the Pearson Correlation revealed that there is a very weak positive correlation ($r=0.14$, $p=0.56$) between intrinsic motivation and the academic performance of the learners. This study firmly concluded that GIM can be one of the innovative teaching strategies in face-to-face learning that can increase both learners' performance and intrinsic motivation.

Keywords: Gamified Instructional Materials (GIM), ARCS Model, Intrinsic Motivation, Polytechnic University of the Philippines

1. INTRODUCTION

On the grounds that the characteristics of the current type of learners born with advanced technologies and the presence of internet connectivity, learners can access educational resources ubiquitously, enabling to be responsible for their own learning. This is more evident since the surge of the Covid-19 pandemic in which the unprecedented event rushed an extensive technology-driven educational system that insists to leverage flexible resources to enhance learning and for the continuity of education despite of difficulties.

Some articles reported a low number of enrollees and massive dropouts for the school year 2020-2021 due to the first-hand challenge brought by the current health crisis to the Philippines' educational system. Whereas the Department of Education clarified through Official Enrollment Figures for SY 2019-2020 & SY 2020-2021, only 4% decreased in the number of enrollees for both formal and informal, this is close to the previous year of 2019 yet there is a decrease in percentage [27]. Accordingly, a senator from a press statement, questioned the amount of learning the students acquire from different modalities, he has also raised the concern of the group of teachers that students may not be officially dropping out, students rarely attend and submitted requirements in their classes under distance learning [26].

This may infer the engagement of students is affected by challenges and limitations caused by the pandemic which also hinders the learners' academic motivation and does influence academic performance [39].

In demand to elicit a resilient learning system, the Department of Education extends its power to mitigate the effect of the abrupt situation that is affecting the learners' engagement in learning. The DepEd Order No. 18 series of 2020 has lifted with the Policy Guidelines for the Provision of Learning resources in the Implementation of the Basic Education Learning Continuity Plan, which calls for innovation for delivering quality education.

Further, in agreement with the provision of innovative instructional materials to be practiced by educators, recent studies recommend gamification as one of the new pedagogical strategies for an effective learning process. Primarily, the game is known for having the exceptional ability to encourage individuals to engage in an activity because of the reward or might be the satisfaction gained from playing [11]. Furthermore, gamification is not a full-fledged game but it is an integration of game elements in an educational context to motivate greater involvement amongst learners [7][9].

Several studies found an increase in motivation through gamification in an educational context [3] [19] [29] [30][5].

In contrast to other studies revealed gamification decreases the student's motivation to engage in the classroom due to game elements [35] [14] [1] [22]. The game elements composing badges, level, and leaderboards etc. are evidently characterized as extrinsic motivation because of external rewards to complete a task. However, a study concluded that gamification does not only offer extrinsic motivation but intrinsic motivation only when applied a proper implementation to prevent competition amongst students [12].

Moreover, some studies associate gamification with students' preferences or self-perception as a player. The preferences or the identified type of players should be taken into account along with the objectives because it influences the learners on how they're going to be motivated and engage in an activity [36] [7]. This supports Bartle's type of players categorized as Achievers, the goal setter; Explorers, who explore and interact with the game itself; Socializers, who prefer to spend time and work with other players; and Killers, who prefer to cause distress to other players [18]

Furthermore, a study that applied a quasi-experimental design analyzed the pre-testing and post-testing results of the students and concluded that gamified instructional materials can influence the academic performance of the students [2] in congruence to the result shown in other studies [12] [4].

1.1 The ARCS Model



Fig -1: The ARCS Model of Motivation

The ARCS Model of Motivation, developed by John Keller, is an instructional design that focuses on the motivational aspects of learning. The ARCS model aims to develop and enhance the instructional materials on basis of the level of motivational learning in four components which comprise Attention, Relevance, Confidence, and Satisfaction indicators. This paper will seek intrinsic motivation, in particular, to identify how the students engage in GIM during the actual class intervention. ARCS will diagnose the existing instructional materials in order to improve and bring effectiveness to learning outcomes [28]. Thus, the model guides educators to examine the effectiveness of instructional material in support of the level of motivation that could possibly increase learners' performance.

This study will determine the efficacy of Gamified Instructional to the learners' academic performance and intrinsic motivation as proven by recent studies. This will be measured by pre-test and post-test results and through

the reduced and modified Instructional Materials Motivation Survey (IMMS) in light of the ARCS Model among Grade 12- ABM students of Horacio Dela Costa High School.

1.2 Statement of the Problem

This study determined the effectiveness of utilizing Gamified Instructional Material (GIM) in increasing the learner's performance and intrinsic motivation. Specifically, this action research sought to answer the following:

1. What is the profile of the respondents in terms of the following:
 - 1.1 Sex
 - 1.2 Group
 - 1.3 Self-perception as a player
 - 1.4 Type of game being played
2. What is the pre-test and post-test performance of the control and experimental group of respondents?
3. Is there a significant difference between the pre-test and post-test performance of the control group and the experimental group?
4. What is the level of the experimental group's intrinsic motivation in light of ARCS model after the intervention of GIM?
5. Is there a significant relationship between the experimental group's intrinsic motivation and performance after the intervention of GIM?
6. Is there a significant relationship between the self-perception as a player and the intrinsic motivation of the experimental group after the intervention of GIM?

1.3 Hypotheses

The following null hypotheses were tested at a 0.05 level of significance.

- H₀: There is no significant difference between the pre-test scores and post-test scores of the control group and the experimental group.
- H₀: There is no significant relationship between the experimental group's intrinsic motivation and performance after the intervention of GIM.
- H₀: There is no significant relationship between the self-perception of the experimental group as a player and their intrinsic motivation after the intervention of GIM.

2. METHODOLOGY

In this action research, two sources of data and information are utilized. The first one is the quantitative response of the participants while the other refers to the supporting literature for the topic of this study. The participants of this study comprise two sections of Grade 12 students under Accountancy and Business Management (ABM) strand of Horacio Dela Costa High School enrolled under limited face-to-face learning during the second semester of the academic year 2021-2022.

In particular, the population of the study comprises of 18 students from ABM-A and 19 students from ABM-B with a total of 37 students in all. The respondents from ABM-A and ABM-B are categorized as the control group and the experimental group respectively.

2.1 Data Gathering Procedures

The researchers of this study utilized the quasi-experimental design since the main purpose of this study is to determine the effectiveness of integrating Gamified Instructional Material (GIM) in increasing the learner's performance and intrinsic motivation while incorporating the ARCS model approach.

Both of the control and experimental groups were taught the same lessons of Media and Information Literacy (MIL) for one week. The control group was taught using the conventional approach whereas the usual projection of PowerPoint Presentation is used while the experimental group was taught using GMI. Both groups were given the same pre-test and post-test evaluation whereas the content of both tests are different from one another. The pre-test and the post-test results of both groups were compared to determine whether using GMI is effective in terms of increasing learners' performance.

On the other hand, the researchers employed the reduced and modified Instructional Materials Motivation Survey (IMMS) in order to measure the participants' reactions to the utilization of GIM in light of the ARCS Model

and to determine whether the intervention can successfully increase the participants' intrinsic motivation during class. This is disseminated online to participants for five days.

2.2 Data Analysis

The researchers of this study used the Statistical Packages for Social Sciences (SPSS) software in order to compute the frequency, percentage, weighted mean, paired samples T-Test, and Pearson Correlation whereas:

1. The percentage and frequency distribution is used to determine the frequency counts and percentage distribution of personal related variables of the respondents.
2. Weighted Mean is used to determine the level of intrinsic motivation in light of the ARCS model and measure the academic performance (pre-post test scores) of the experimental group.
3. Paired Samples T-test is used to test if there is any significant difference between matched pairs of data particularly the pre-test score and post-test score of the control and experimental group.
4. Pearson Correlation Coefficient is used to test if there is a significant relationship between intrinsic motivation and performance as well as self-perception as a player and the intrinsic motivation of the experimental group after the intervention of GIM.

3. RESULTS AND DISCUSSION

The following are the results and analyses done in this quasi-experimental study.

Table -1: Frequency and Percentage Distribution in terms of Sex

Sex Profile	Frequency (f)	Percentage (%)
Male	8	22.2%
Female	28	77.8%
TOTAL	36	100%

Table 1 shows the respondents' profile in terms of sex with their corresponding frequency and percentage value. It clearly represents that female respondents have a higher frequency ($f=28$) which corresponds to 77.8% than the male respondents ($f=8$) which correspond to 22.2%. The respondents of this study have more female respondents than male respondents which are more probable to happen merely because the population where the sample size was drawn has an uneven number of male and female teacher respondents whereas the female is greater in number.

Table -2: Frequency and Percentage Distribution in terms of Group

Group	Frequency (f)	Percentage (%)
Control	17	47.2%
Experimental	19	52.8%
TOTAL	36	100%

As can be gleaned from Table 2, the frequency and percentage value in terms of group were distributed. The control group has a frequency and percentage of 17 and 47.2% respectively. On the other hand, the experimental group has a frequency and percentage of 19 and 52.8% respectively. All in all, there are 36 participants that comprise the control and experimental group.

Table -3: Frequency and Percentage Distribution of Experimental Group's Self-perception as Video Game Player

Self-Perception as Player	Frequency (f)	Percentage (%)
Achiever	5	26.3%
Explorer	11	57.9%
Socializer	1	5.3%
Not playing video game	2	10.5%

TOTAL	19	100%
-------	----	------

Table 3 indicates the frequency and percentage distribution of the experimental group's self-perception as video game player. Out of the total 19 students comprising the experimental group, 26.3% (f=5) perceives that they are achiever, 57.9% (f=11) perceives that they are explorer, 5.3% (f=1) perceives that they are socializer and 10.5% (f=2) are not playing a video game so they cannot classify themselves among the given type of video game players.

In 1996, Richard Bartle formulated the Bartle taxonomy of player types or the Multi-user classification of video game players. Bartle categorized the types of players into four groups which include Explorer, Killer, Socializer and Achiever. This action research only incorporated three categories the Explorer, Achiever, and Socializer

As examined in the table above, explorers dominated the highest percentage of the students who answered the IMMS. Explorers are those concerned is to experience things from discoveries; achievers are the ones who more care about the rewards and rankings, they set goals to achieve. While the socializers gained satisfaction from playing through interaction and collaboration with other players to achieve goals. [18].

Table -4: Frequency and Percentage Distribution of Type of Game Being Played by the Experimental Group

Type of Video Game	Frequency (f)	Percentage (%)
Multiplayer Online Battle Arena (MOBA)	6	31.6%
Board/Card Game	3	15.8%
Role Playing Game (RPG)	8	42.1%
Not playing video game	2	10.5%
TOTAL	19	100%

Table 4 only depicts the Frequency and Percentage Distribution of Type of Game being played by the Experimental Group. The result shows that 31.6% (f=6) of the respondents play Multiplayer Online Battle Arena (MOBA), 15.8% (f=3) play Board/Card Game while majority of the respondents or 42.1% (f=8) play Role Playing Game (RPG) and the other two or 10.5% (f=2) are not playing video game.

According to Elliott from Newszoo a game report provider online, 77% of the online population in the Philippines play games on mobile which is the most popular platform to play games same in the neighboring countries in Southeast Asia [10]. The author also cited that the most popular genre the gamers' choice, in general, are strategy and puzzle games which may include the three types of video games used to play by the learners in Horacio Dela Costa High school.

RPG or role-playing games are the mobile's biggest genre revenue with 21.3% and the three top markets in Asia are china, japan and South Korea which generated 13.34 Billion dollars in 18.5 Billion dollars of Global revenues in RPG genre in 2020 [6]. Besides, MOBA, or the Multiplayer Online Battle Arena as the second top genre in this survey, the genre is also one of the most competitive and lucrative game genres in the world game market gaining its popularity in Esports, a professional game competition participated by different countries.

Table -5: Pre-test and Post-test Performance of the Control and the Experimental Group of Respondents

PERFORMANCE	GROUP	N	MEAN
PRE-TEST	Control	17	6.72
	Experimental	19	7.92
POST-TEST	Control	17	8.60
	Experimental	19	9.68

Table 5 clearly shows the pre-test and post-test performance of the control and the experimental group of respondents. As can be seen, the experimental group has a relatively higher pre-test mean score of 7.92 compared to the control group which has a mean score of 6.72. On the other hand, the post-test mean score of the experimental group (M=9.68) is higher compared to the mean score of the control group (M=8.60). This implies that the class with GIM intervention scored relatively higher on both pre-test and post-test evaluations.

Table -6: Paired Samples T-Test between the Pre-Posttest Performance of the Control Group and Experimental Group

PAIRED SAMPLES	MEAN	STANDARD DEVIATION	Sig. (2-tailed)	Remarks
PRE-TEST				
Control - Experimental	1.200	1.118	0.000**	Reject H ₀
POST-TEST				
Control - Experimental	1.080	1.320	0.000**	Reject H ₀

**Statistically significant/Reject H₀

As can be gleaned from Table 6, the Paired Samples T-Test between the Pre-Posttest Performance of the Control Group and Experimental Group. Further, it can be seen that the paired samples of control-experimental during the pre-test has a mean score of 1.20 (SD=1.12, p=0.000) leading the researchers to reject the null hypothesis because there is a statistical difference between the pre-post test scores of control-experimental groups. In addition, the paired samples of control-experimental during the post-test evaluation has a mean score of 1.0 (SD=1.32, p=0.000) leading the researchers to reject the null hypothesis because there is a statistical difference between the pre-post test scores of control-experimental groups.

Simply put, the researchers assert that both pre-test and post-test performance of the control and experimental group have a significant difference. The same findings were found in the study initiated by the researchers who applied a quasi-experimental design to assess significant differences from obtained pre-test and post-test scores between the control and the intervention group or the experimental group. The results revealed pre-test and post-test scores have significant differences for both groups but the experimental group obtained higher scores from pre-test to post-test than the control group [2]. Thus, researchers of this study may conclude that Gamification can influence the academic performance of students.

Table -7: The Intrinsic Motivation of Experimental Group in terms of Attention after the Intervention of Gamified Instructional Material (GIM)

INDICATORS	MEAN	VERBAL INTERPRETATION
1. The information in the gamified instructional material keeps my attention.	3.26	Strongly Agree
2. The font style and other design features in gamified instructional materials caused me to be attentive in class.	3.32	Strongly Agree
3. The idea of gamified instructional material is eye-catching and really interesting.	3.42	Strongly Agree
4. I listen very carefully to the discussion because of the effective use of gamified instructional materials.	3.58	Strongly Agree
5. The gamified instructional materials have features that stimulated my curiosity.	3.42	Strongly Agree
6. The variety of exercises, illustrations, etc., on the gamified instructional material helped keep my attention	3.53	Strongly Agree
TOTAL WEIGHTED MEAN	3.42	Strongly Agree

Table 7 reveals the Intrinsic Motivation of the Experimental Group in terms of Attention after the Intervention of Gamified Instructional Material (GIM). The result further reveals that the experimental group strongly agrees that the information in the GIM keeps their attention (M=3.26), the font style and other design features in GIM caused them to be attentive in class (M=3.32), the idea of GIM is eye-catching and really interesting (M=3.42), the experimental group also strongly agrees that they listen very carefully to the discussion due to the

effective use of GIM ($M=3.58$), the GIM have features that stimulated their curiosity ($M=3.42$) and the variety of exercises, illustrations, among others on the gamified instructional material helped keep their attention ($M=3.53$).

According to the University of Southern Maine, Attention is the first step in learning, Additionally, paying attention means bringing the information into the brain for what is presented and discussed upbringing senses to get focus on the absorption of information [37].

Several studies claimed that learners decline attention after 10-15 minutes of discussion. However, according to the study examined by researchers from Microsoft Corporation, the average human attention span decreases to 8 seconds in 2013 from 12 seconds in 2000 or since the beginning of the widespread utilization of mobile phones [33].

Moreover, features like visual and graphic design incorporated in instructional materials are proven effective to stimulate the students' motivation during discussion. A study stated that visual and graphic design to convey information to increase learners' motivation are effective when appropriately structured according to their function [31]. The common types of illustrations used in instruction are symbolic to illustrate information; organizational pictures that illustrate a series of steps; interpretational pictures that illustrate simplified information for clarification with the text; lastly, and transformative pictures that illustrate information with picture association [31].

On the other hand, the Secretary of the Department of Education, Leonor Magtolis Briones said after the announcement of the partnership with Microsoft Philippines for a modern learning experience Microsoft Education Edition or MEE, "This gamified tool captures the attention of our young learners because it's easy to use and entertaining..." [8]. This may imply that Gamified tools like GIM can completely grab the attention of the students through its convenience and entertainment.

Table -8: The Intrinsic Motivation of Experimental Group in terms of Relevance after the Intervention of Gamified Instructional Material (GIM)

INDICATORS	MEAN	VERBAL INTERPRETATION
1. The content was related and relevant to things I already know.	3.05	Strongly Agree
2. The content of the gamified instructional material conveyed the impression that lessons can be more associative to real-life situation.	3.26	Strongly Agree
3. The features of gamified instructional materials made the lesson more synchronized to the desired learning outcomes of our lesson.	3.32	Strongly Agree
4. Completing all of the exercises in gamified instructional materials successfully was relevant to me.	3.42	Strongly Agree
5. The gamified instructional materials presented directions/instructions on how I could participate.	3.53	Strongly Agree
6. I could relate the content of the gamified instructional materials to the things I have seen, done, or thought about before.	3.21	Strongly Agree
TOTAL WEIGHTED MEAN	3.30	Strongly Agree

Table 8 states the Intrinsic Motivation of Experimental Group in terms of Relevance after the Intervention of Gamified Instructional Material (GIM). The result further reveals that the experimental group strongly agrees that the content of GIM was related and relevant to things they already know ($M=3.05$) and conveyed the impression that lessons can be more associative to the real-life situation (3.26). Further, the experimental group also responded strongly agree that completing all of the exercises in GIM successfully was relevant to them ($M=3.42$) and they can relate the content of the GIM to the things they have seen, done, or thought about before ($M=3.21$). Lastly, the experimental group strongly agree that GIM presented directions/instructions on how they participated.

According to the Glossary of the Education Reform the term relevance pertains to the experiences connected to oneself or personal relevance based on the interest and preference in selection and producing output. It represents in different forms, Individual choices, for instance, a student can select who her/his favorite band that is according to his/her preference; Product choices, allowing students to select a product according to their ability or

skills; Varied Content, allowing students to select an area of personal interest, it may be politics, business, education etc.; lastly, cultural connections that allow students to provide their opinion based on the viewpoint of their race or their cultural heritage. On the other hand, Life relevance pertains to the real-world challenges that may acquire outside the campus. Allowing students to acquire life skills that they may apply in their daily lives [13].

Moreover, a study highlighted an educator should involve his/her students in real-life situations incorporated into instructional materials where students are able to relate their interests and leverage autonomy, an element of intrinsic motivation. The aforementioned author also cited if the students are able to use the knowledge and skills gained from the instruction, they will be able to understand themselves and their surroundings better [20].

Table -9: The Intrinsic Motivation of Experimental Group in terms of Confidence after the Intervention of Gamified Instructional Material (GIM)

INDICATORS	MEAN	VERBAL INTERPRETATION
1. I felt confident that I could learn well with gamified instructional materials.	3.37	Strongly Agree
2. I felt confident that I would be able to complete exercises with the gamified instructional materials.	3.37	Strongly Agree
3. The proper organization of the content helped me to be confident that I would learn with gamified instructional materials.	3.42	Strongly Agree
4. When I first looked in the gamified instructional material, I had the impression that this would be easy to work with.	3.42	Strongly Agree
5. The exercises in gamified instructional materials were not that difficult.	3.21	Strongly Agree
6. I clearly understood the information presented through gamified instructional materials.	3.37	Strongly Agree
TOTAL WEIGHTED MEAN	3.36	Strongly Agree

Table 9 shows the Intrinsic Motivation of the Experimental Group in terms of Confidence after the Intervention of Gamified Instructional Material (GIM). The result further reveals that the experimental group strongly agrees that they felt confident that they could learn well with gamified instructional materials (M=3.37) and they felt confident that they would be able to complete exercises with the gamified instructional materials. (M=3.37). Further, the experimental group also responded strongly agree that The proper organization of the content helped them to be confident that they would learn with gamified instructional materials (M=3.42), when they first looked at the gamified instructional material, they had the impression that the GIM would be easy to work with (M=3.21) and when the exercises in gamified instructional materials were not that difficult for them. Lastly, the experimental group strongly agree that the information presented in GIM was clearly understood.

Confidence is the third subsection in ARCS Model, which implies that confidence should be incorporated into the instruction to promote confidence among students to amplify motivation. This allows students' confidence in their learning expectancy with success. Further, the students will be optimistic and courageous in every activity knowing their ability to achieve a certain task without the doubt of failure, this will achieve when confidence were established among students and early intervention from Educators [32]. However, the authors also added that failure to institute confidence among learners leads to their assumption that their energy and effort are just procrastination leads in poor engagement in the classroom.

Table -10: The Intrinsic Motivation of Experimental Group in terms of Satisfaction after the Intervention of Gamified Instructional Material (GIM)

INDICATORS	MEAN	VERBAL INTERPRETATION
1. I am really stimulated to keep on participating until the end of the lesson because the gamified instructional material is engaging.	3.63	Strongly Agree

2. I really enjoyed learning with gamified instructional materials.	3.63	Strongly Agree
3. It was a pleasure to learn with such well-designed gamified instructional materials.	3.58	Strongly Agree
4. Completing the exercises in gamified instructional materials made me feel rewarded for my effort.	3.68	Strongly Agree
5. The use of gamified instructional materials increased my learning retention.	3.47	Strongly Agree
6. It felt good to successfully get a high score during the activity/assessment presented through gamified instructional materials.	3.63	Strongly Agree
TOTAL WEIGHTED MEAN	3.60	Strongly Agree

Table 10 shows the Intrinsic Motivation of the Experimental Group in terms of Satisfaction after the Intervention of Gamified Instructional Material (GIM). As can be gleaned from the table, the result further reveals that the experimental group strongly agrees that they were really stimulated to keep on participating until the end of the lesson because the GIM is engaging ($M=3.63$) and the respondent also enjoyed learning with GIM ($M=3.64$). The experimental group strongly agrees that it was a pleasure to learn with such a well-designed GIM ($M=3.58$) and they felt rewarded as they finish the exercises in GIM (3.68). The respondents also strongly agree that the use of GIM increased their learning retention ($M=3.47$) and according to the experimental group, they felt good about successfully getting a high score during the activity/assessment presented through GIM (3.63).

A study confirmed that learning activities promoting active learning can positively influence the students' satisfaction in their learning process for both groups of learners in traditional classrooms [16]. The researchers also revealed that educators can intentionally provide active pedagogical to amplify the satisfaction of students with their learning process. Considering Gamification as a new pedagogical strategy prior to active learning because of its interactive characteristics may therefore utilize to enhance active learning. Moreover, a study stated that other than pedagogy used by the teacher, the author disclosed that learners' satisfaction has also a direct relationship to learning objectives and teacher performance [34].

Table -11: The Overall Experimental Group's Intrinsic Motivation in light of ARCS model after the Intervention of Gamified Instructional Material (GIM)

INDICATORS	MEAN	VERBAL INTERPRETATION
Attention	3.42	Strongly Agree
Relevance	3.30	Strongly Agree
Confidence	3.36	Strongly Agree
Satisfaction	3.60	Strongly Agree
TOTAL WEIGHTED MEAN	3.42	Strongly Agree

The Table above is all about the overall experimental group's intrinsic motivation in light of the ARCS model after the intervention of GIM. It clearly shows that the experimental group strongly agrees on the effectiveness of GIM particularly in increasing their intrinsic motivation as anchored to each component of the ARCS model based on the reduced and modified Instructional Materials Motivation Survey (IMMS) garnering a total weighted mean of ($M=3.42$). This further implies that GIM can be used as an innovative tool to engage and motivate students while learning.

Gamification as a pedagogical strategy in creating instructional materials has proven its efficacy to amplify motivation amongst students and like another pedagogical strategy, inadequate structure design of the GIM may lead to demotivation and ineffective facilitation of learning. Thus, ARCS Model, a motivational design assesses the effectiveness of instructional materials through the students' viewpoint as they are the receiver of the instruction. The researchers of this study may conclude that the GIM introduced in the Experimental group was effective and thus stimulate motivation measured by IMMS divided into four subsections; Attention, Relevance, Confidence and Satisfaction. The same result also appears to a study which they used different audiovisual instruction to facilitate learning [28]. Moreover, another study declared the integration of three subsections; attention, confidence and

satisfaction in their instructional materials escalates the motivation of the students. However, the subsection relevance does not influence their motivation [15].

Table -12: Pearson Correlation Between the Intrinsic Motivation and Academic Performance of the Experimental Group

		INTRINSIC MOTIVATION	ACADEMIC PERFORMANCE
INTRINSIC MOTIVATION	Pearson Correlation	1	.142**
	Sig. (2-tailed)		.563
	N	19	19
ACADEMIC PERFORMANCE	Pearson Correlation	.142**	1
	Sig. (2-tailed)	.563	
	N	19	19

** $0.0 \leq |r| < 0.2$: Very Weak Correlation

Table 12 highlights the Pearson Correlation between Intrinsic Motivation and Academic Performance of the Experimental Group. The analysis revealed that there is a very weak positive correlation ($r = 0.14$) between intrinsic motivation and the academic performance of learners. The p-value or the Sig. (2-tailed) of 0.56 further justifies this result. The result revealed that there is a significant relationship but a very weak association between the two variables thus implying that when intrinsic motivation increases it does not necessarily mean that the academic performance of the students also increases at the same. Therefore, the result rejects the null hypothesis indicating that there is no significant relationship between the variables.

To date, there is no studies attempted to find the relationship between intrinsic motivation and academic performance in consideration of Gamified Instructional materials. A researcher argued that studies may not attempt to examine the relationship between intrinsic motivation and academic performance given the attribution that human beings are innately interested to complete tasks and that improves overall performance [23]. Further, a study associates intrinsic motivation and academic performance due to the internal drive to learn and engage that leads to performing better in the activity itself without the external rewards [25]. Other than that, a study which also measured the relationship between intrinsic motivation and academic performance however irrelative to GIM has found the same findings as this study that there is a significant, positive yet weak relationship [38].

Table -13: Pearson Correlation Between the Self-perception as a Player and the Intrinsic Motivation of the Experimental Group

		INTRINSIC MOTIVATION	SELF-PERCEPTION AS A PLAYER
INTRINSIC MOTIVATION	Pearson Correlation	1	-.065**
	Sig. (2-tailed)		.790
	N	19	19
SELF-PERCEPTION AS A PLAYER	Pearson Correlation	-.065**	1
	Sig. (2-tailed)	.790	
	N	19	19

** $0.6 \leq |r| < 0.8$: Negative Strong Correlation

Table 13 reveals the Pearson Correlation between the Self-perception as player and the Intrinsic Motivation and Academic Performance of the Experimental Group. The analysis revealed that there is a negative strong correlation ($r = -0.065$) between the intrinsic motivation and self-perception of the learners as players. The p-value or the Sig. (2-tailed) of 0.79 further justifies this result. This suggests that being an achiever, explorer and socializer type of video game player does not increase the intrinsic motivation of the learners.

Learners that are going to engage in gamified learning activities have different motivations, skills and objectives [17]. Therefore, the researchers of this study derive an assumption that a GIM that may group students according to their self-perception in four types of players may have found themselves in four categories but not perfectly fit due to individualism. The intrinsically motivated individual presents naturally when they sense autonomy and freedom to follow their own interest without limiting by certain rules and designation.

A study concluded that gamification motivates students regardless of their player types after their results found Bartle's type of players is not statistically significant to intrinsic motivation. Instead, the said researchers proposed to observe the game elements and consider preferred rules and strategies by the students to maintain active learning over a passive system [24].

4. CONCLUSIONS

After the careful gathering and analysis of data, the researchers of this study firmly concluded that the utilization of Gamified Instruction Materials (GIM) significantly increases the academic performance of the learners based on their pre-post test scores. At the same time, GIM also helps increase the intrinsic motivation of the learners in terms of the Attention, Relevance, Confidence, and Satisfaction (ARCS) model. This vindicates that GIM can be considered as one of the innovative teaching strategies that can be applied in a face-to-face learning setup while utilizing technology and other digital tools for delivering the lesson to the learners.

This quasi-experimental study recommends that teachers, especially in face-to-face learning may consider the utilization of Gamified Instructional Material (GIM) in increasing both learners' performance and intrinsic motivation during their classes because the transition from online to face-to-face learning has brought a wide learning gap that must be bridged at the soonest possible time.

Moreover, this study further recommends that the government should provide adequate programs and training that can help the educators upskill their knowledge and skills in integrating technology in delivering the lessons, particularly through crafting and utilizing effective Gamified Instructional Materials (GIM) that are relevant to the needs of the learners.

Lastly, future researchers are recommended to conduct a large-scale investigation on the other innovative teaching strategies that can be used in both online and face-to-face learning to increase the academic performance and intrinsic motivation of the learners and serve the purpose to contribute to the body of knowledge in the field of innovative teaching.

5. REFERENCES

- [1]. Aji, T. P., & Napitupulu, T. A. (2018). Effect of gamification on E-learning to support learning achievement and learning motivation. *Journal of Theoretical and Applied Information Technology*, 96(12), 3643–3653.
- [2]. Arufe Giráldez, V., Sanmiguel-Rodríguez, A., Ramos Álvarez, O., & Navarro-Patón, R. (2022). Can gamification influence the academic performance of students? *Sustainability*, 14(9), 1–17. <https://doi.org/10.3390/su14095115>
- [3]. Bicen, H., & Kocakoyun, S. (2018). Perceptions of Students for Gamification Approach: Kahoot as a Case Study. *International Journal of Emerging Technologies in Learning (IJET)*, 13(02), 72. <https://doi.org/10.3991/ijet.v13i02.7467>
- [4]. Brian Chen, C. C., Kathy Huang, C. C., Gribbins, M., & Swan, K. (2018). Gamify online courses with tools built into your learning management system (Lms) to enhance self-determined and active learning. *Online Learning Journal*, 22(3), 41–54. <https://doi.org/10.24059/olj.v22i3.1466>
- [5]. Buckley, P., & Doyle, E. (2016). Gamification and student motivation. *Interactive Learning Environments*, 24(6), 1162-1175.
- [6]. Chen, F. (2021). RPGs are Mobile's biggest genre by revenues: How do gamers across East and west engage with the genre? *Newzoo*. Retrieved from <https://newzoo.com/insights/articles/rpgs-are-mobiles-biggest-genre-by-revenues-how-do-gamers-across-east-and-west-engage-with-the-genre>
- [7]. Christians, G. (2018). The origins and future of Gamification. *Scholar Commons*. Retrieved from 254. https://scholarcommons.sc.edu/senior_theses/254
- [8]. DepEd, Microsoft Philippines engages students, teachers through game-based learning. Department of Education. (2022, April). Retrieved from https://www.deped.gov.ph/2022/04/28/deped-microsoft-philippines-engages-students-teachers-through-game-based-learning/?utm_source=rss&utm_medium=rss&utm_campaign=deped-microsoft-philippines-engages-students-teachers-through-game-based-learning

- [9]. Deterding, S. (2012). Gamification: designing for motivation. *Interactions*, 19(4), 14–17. <https://doi.org/10.1145/2212877.2212883>
- [10]. Elliott, R. (2020, December). The Philippines' games market: Data and insights. Newzoo. Retrieved from <https://newzoo.com/insights/articles/data-and-insights-on-the-philippines-games-market>
- [11]. Figueroa-Flores, J. F. (2016). Gamification and game-based learning: Two strategies for the 21st Century learner. *World Journal of Educational Research*, 3(2), 507. <https://doi.org/10.22158/wjer.v3n2p507>
- [12]. Funari, A. A., Gabay, R. A., & Ricafort, J. D. (2021). Gamification in genetics: Effects of gamified instructional materials on the stem students' intrinsic motivation. *Jurnal Pendidikan IPA Indonesia*, 10(4), 462–473. <https://doi.org/10.15294/jpii.v10i4.32143>
- [13]. Great Schools Partnership. (2013, August). Relevance definition. *The Glossary of Education Reform*. Retrieved from <https://www.edglossary.org/relevance/>
- [14]. Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers and Education*, 80, 152–161. <https://doi.org/10.1016/j.compedu.2014.08.019>
- [15]. Herianto, & Wilujeng, I. (2021). Increasing the attention, relevance, confidence and satisfaction (arcs) of students through Interactive Science Learning Multimedia. *Research in Learning Technology*, 29. <https://doi.org/10.25304/rlt.v29.2383>
- [16]. Hyun, J., Ediger, R., & Lee, D. (2017). Students' Satisfaction on Their Learning Process in Active Learning and Traditional Classrooms, 29, 108–118. <https://doi.org/ISSN1812-9129>
- [17]. Iacono, S., Vallarino, M., & Vercelli, G. V. (2020). Gamification in corporate training to enhance engagement: An approach. *International Journal of Emerging Technologies in Learning (IJET)*, 15(17), 69. <https://doi.org/10.3991/ijet.v15i17.14207>
- [18]. Kumar, J. M., Herger, M., & Dam, R. F. (2020). Bartle's player types for Gamification. *The Interaction Design Foundation*. <https://www.interaction-design.org/literature/article/bartle-s-player-types-for-gamification>
- [19]. Loos, L. A., & Crosby, M. E. (2017). Gamification methods in higher education. *Lecture Notes in Computer Science*, 474–486. https://doi.org/10.1007/978-3-319-58509-3_37
- [20]. McClure, N. (2012). Demonstrated the importance and significance of the subject matter. *IDEA*. Retrieved from <https://www.ideaedu.org/idea-notes-on-instruction/demonstrated-the-importance-and-significance-of-the-subject-matter/>
- [21]. Mee Mee, R. W., Pek, L. S., Von, W. Y., Abd Ghani, K., Tengku Shahdan, T. S., Ismail, M. R., & Rao, Y. S. (2021). A conceptual model of analogue gamification to enhance learners' motivation and attitude. *International Journal of Language Education*, 5(2), 40–50. <https://doi.org/10.26858/ijole.v5i2.18229>
- [22]. Mese, C., & Ozgur Dursun, O. (2019). Effectiveness of gamification elements in blended learning environments. *Turkish Online Journal of Distance Education*, 20(3).
- [23]. Oclaret, V (2021). Impact of Academic Intrinsic Motivation Facets on Students' Academic Performance. 10.13140/RG.2.2.16764.46723
- [24]. Park, S., Min, K., & Kim, S. (2021). Differences in learning motivation among Bartle's player types and measures for the delivery of sustainable gameful experiences. *Sustainability*, 13(16), 9121. <https://doi.org/10.3390/su13169121>
- [25]. Pascoe, L., Spencer-Smith, M., Giallo, R., Seal, M. L., Georgiou-Karistianis, N., Nosarti, C., Josev, E. K., Roberts, G., Doyle, L. W., Thompson, D. K., & Anderson, P. J. (2018). Intrinsic motivation and academic performance in school-age children born extremely preterm: The contribution of working memory. *Learning and Individual Differences*, 64, 22–32. <https://doi.org/10.1016/j.lindif.2018.04.005>
- [26]. Press release - gatchalian: Learners may not be dropping out, but are they learning enough? (2021). Retrieved from https://legacy.senate.gov.ph/press_release/2021/0131_gatchalian1.asp
- [27]. Programs and projects status of Implementation - Department of Education. (2020). Retrieved from https://www.deped.gov.ph/wp-content/uploads/2021/10/DepEd_Programs-and-Project-Status-of-Implementation_2020.pdf
- [28]. Refat, N., Kassim, H., Rahman, M. A., & Razali, R. bin. (2020). Measuring student motivation on the use of a mobile assisted grammar learning tool. *PLOS ONE*, 15(8). <https://doi.org/10.1371/journal.pone.0236862>
- [29]. Romero-Rodriguez, L. M., Ramirez-Montoya, M. S., & Gonzalez, J. R. V. (2019). Gamification in MOOCs: Engagement Application Test in Energy Sustainability Courses. *IEEE Access*, 7, 32093– 32101. <https://doi.org/10.1109/ACCESS.2019.2903230>
- [30]. Sánchez-Mena, A., & Martí-Parreño, J. (2017). Drivers and Barriers to Adopting Gamification: Teachers' Perspectives. *The Electronic Journal of E-Learning*, 15(1), 434.

- [31]. Sentz, J. (2020). Using Visual and Graphic Elements: While Designing Instructional Activities. In J. K. McDonald & R. E. West, *Design for Learning: Principles, Processes, and Praxis*. EdTech Books. Retrieved from https://edtechbooks.org/id/using_visual_and_graphic_elements
- [32]. Sihotang, L., Setiawan, D., & Saragi, D. (2017). The effect of learning strategy and self confidence toward student's learning outcomes in Elementary School. *IOSR Journal of Research & Method in Education (IOSRJRME)*, 07(04), 65–72. <https://doi.org/10.9790/7388-0704016572>
- [33]. Spring. (2015). Microsoft attention spans, spring 2015 | @msadvertisingca # ... Microsoft Attention Span. Retrieved from <https://dl.motamem.org/microsoft-attention-spans-research-report.pdf>
- [34]. Sunitha, e. a. d. i. (2021). Student's Satisfaction on Today's Teaching Pedagogy , 23(9), 53–58. <https://doi.org/e-ISSN: 2278-487X, p-ISSN: 2319-7668>
- [35]. Toda, A. M., Valle, P. H., & Isotani, S. (2018). The Dark Side of Gamification: An overview of negative effects of gamification in Education. *Communications in Computer and Information Science*, 143–156. https://doi.org/10.1007/978-3-319-97934-2_9
- [36]. Tu, C.-H., Yen, C.-J., Sujo-Montes, L., & Roberts, G. A. (2015). Gaming personality and Game Dynamics in online discussion instructions. *Educational Media International*, 52(3), 155–172. <https://doi.org/10.1080/09523987.2015.1075099>
- [37]. University of Southern Maine. Paying Attention | Academic Gains through Improved Learning Effectiveness (AGILE) | University of Southern Maine. (n.d.). <https://usm.maine.edu/agile/paying-attention#:~:text=Think%20about%20when%20a%20friend,are%20challenges%20to%20paying%20attention.>
- [38]. Yarin, A. J., Encalada, I. A., Elias, J. W., Surichacqui, A. A., Sulca, R. E., & Pozo, F. (2022). Relationship between motivation and academic performance in Peruvian undergraduate students in the subject mathematics. *Education Research International*, 2022, 1–11. <https://doi.org/10.1155/2022/3667076>
- [39]. Zaccoletti, S., Camacho, A., Correia, N., Aguiar, C., Mason, L., Alves, R. A., & Daniel, J. R. (2020). Parents' perceptions of student academic motivation during the COVID-19 lockdown: A cross-country comparison. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.592670>