



The Effect of Using Mechanics, Dynamics and Emotions Gamification Framework on Iranian Primary School Learners' Engagement and Phonics Alphabets Acquisition

Saba Akbari¹

1. MA Student of Science and Research Branch, Islamic Azad University, Tehran, Iran

Abstract

The study investigates the utility of MDE gamification framework. To do this, 96 students from elementary school in Tehran, Iran were selected. The sample population divided into two groups; namely, control and experimental. The students in the experimental group were taught with the different methods that the researcher implemented. The students in the control group did not receive any instruction. During the class, the researcher tried to observe the student's characteristics and filled the observation checklist three times at the beginning of the class, during the class, and at the end of the class. The observation items were prepared for each student and filled with researcher and cooperation between the teacher and the students analyzed. The pre-test and post-test tests were designed based on the standards of Phonics structure. A 't-test' on the mean scores of both groups indicated a significant difference between the scores of the post-tests, meaning that the gamification framework was significantly effective on the learners' engagement and phonics alphabets acquisition. Findings led to the conclusion that the experimental group outperformed the control group. The product of this study can help curriculum designers; language instructors and practitioners appreciate the importance of gamification framework.

Key words: "gamification framework", "learners' engagement", "phonics alphabets acquisition".



Introduction

The fundamental skills of being able to realize and pronounce letters need to be developed at a young age and should be targeted if a child is not developing at a positive rate. Students that do not acquire letter-sound recognition could struggle later in life with spelling, reading, and writing. Literacy knowledge starts to be acquired and mastered early which makes it crucial to give proper support to inspire learning. Many authors describe the goal of phonics instruction as the students having the capability to develop an understanding of the alphabetic principle (Villaume & Brabham, 2003). An alphabetic principle is known as the knowledge that letters represent phonemes and that they are always represented by the same letter wherever they appear in a word. Students who are able to understand the alphabetic principle will know that sounds of words are laid out through a system, as well being able to use letter-sound relations to find out novel words (Villaume & Brabham, 2003; De Graaff et. al., 2009; Byrne & Fielding-Barnsley, 1989). In this sense, gamified phonics instruction activities could be a very useful alternative for students to overcome difficulties when producing vowel sounds and understanding the difference between vowel sounds of the mother tongue and EFL vowel sounds.

Literature review

In recent years there has been enthusiasm within the education world around gamification and game-based learning (Buckley & Doyle, 2016). Roy and Zaman (2018) summarize gamification in education as the use of various game elements to extend student engagement. In an educational context, gamification permits the learners to obtain direct feedback concerning their improvement within the classroom and acknowledgment of completed activities (Kapp, 2012). Due to the increase in students' engagement, we tend to see an enhancement in students' satisfaction and an improvement in their performance (Martin & Bolliger, 2018). Several studies have reported that early childhood education has a great impact on a child's socialization, growth, and academic success. Education in childhood is an important and fundamental stage. This becomes one of the best ways to provide future generations with the skills and competencies needed to succeed in future job markets. In fact, recent educational neuroscience research shows that the best way to teach children through play is to get their attention, engage them, get true feedback, and consolidate their skills. The playful behavior can be considered an exploratory and knowledge-building component (Assaf, 2010). Besides, playing at a younger age improves the learner's qualifications to deal with real-life situations and interact with the real world, once they play, they use many of their senses to acquire numerous information and extend their knowledge regarding their environment and additionally they develop new skills and capabilities (e.g., talking, thinking, etc.) through playing (Piaget, 1952). For children, playing is the natural way to improve their future skills starting from an early age (Sheridan, Howard, & Alderson, 2014). Engaged students devote a considerable amount of time and effort to their academic experiences. Werbach and Hunter (2012) suggested that putting game elements together is an important task, and complete mastery of them all is hardly possible. On the other hand, they also mention that the list of items is not enough to create something useful and exciting.

The gamification system should be optimally adapted to the relevant conditions; its elements should be coordinated and implemented well in order to lead to learning. Gamification in education aims at



redesigning teaching and learning systems to utilize the advantages of game-based learning to inspire learners to learn better, further engage them, situate their learning, and maintain their social identity.

Mechanics, Dynamics and Aesthetics (MDA) model divides the process of game consumption by the player into three parts: rules, system, and entertainment (Honicke, Leblance, & Zubek, 2004). Under the category of aesthetics are sensation (game as sense-pleasure), fantasy (game as make-believe), narrative (game as drama), challenge (game as obstacle course), fellowship (game as a social framework), discovery (game as uncharted territory), expression (game as self-discovery), and submission (game as a pastime). These aesthetics will be understood as completely different goals of games and also the elements of fun (Honicke, Leblance, & Zubek, 2004). Dynamics within the MDA model are the game style principles that make and support aesthetic experience. As an example, time pressure and opponent play are two game dynamics that make and support the aesthetic of challenge. The dynamics of sharing information across certain members of a session (a team) or supply winning conditions that are more difficult to attain alone are for the game aesthetic of fellowship (Sheridan, Howard, & Alderson, 2014). The aesthetic of expression is formed and supported by the dynamics that encourage individual users to leave their mark, like systems for getting, building, or earning game items; for designing, constructing, and dynamical levels or worlds; and for making personalized, distinctive characters (Honicke, Leblance, & Zubek, 2004). Mechanics refers to the various actions, behaviors, and control mechanisms afforded to the player within a game context. Since the purpose of this study was to investigate the utility of using mechanics, dynamics and emotions gamification framework on Iranian primary school learners' engagement and phonics alphabets acquisition, this study posed the following questions:

Q1. Does gamification framework have any significant effect on Iranian primary school learner's engagement?

Q2. Does gamification framework have any significant effect on Iranian primary school learner's phonics alphabets acquisition?

Method

Participants were 96 students from elementary school in Tehran, Iran who were studying Jolly Phonics books. The researcher randomly selected students with a basic and elementary understanding of Phonics. This study conducted with Iranian female and male students only whose age range was from 7 to 10. The sample population divided into two groups; namely, control (N=48) and experimental (N=48). Both qualitative and quantitative data collection tools used in this study. To collect quantitative data, a pre-test and post-test on learning phonics alphabets administered to the control and experimental groups. Another instrument was observation checklist. The observation checklist was used to find out the behavior changes during the classes to check the engagement of the students. The gamified training process began in the experimental group that was to be treated. The students in this group were taught with the different methods that the researcher implemented, and it is constantly tried to increase the student's engagement with the educational content of Phonics alphabets. The students in the control group did not receive any instruction. The researcher taught experimental group English sounds and letters, words, and sentences by using the techniques of engaging, motivating and using all kinds of gamification frameworks and applying the methods of teaching phonics. In order to submit activities at the appointed time and create a stronger communication network, students submitted their



activities such as playing in Moodle, outside of class time. During the class, the researcher tried to observe the student's characteristics and filled the observation checklist three times at the beginning of the class, during the class, and at the end of the class. The observation items (Appendix A) were prepared for each student and filled with researcher during the class and cooperation between the teacher and the students analyzed. The pre-test and post-test tests were designed based on the standards of Phonics structure and the observation was designed based on the characteristics of the student engagement questionnaire in school (SEQS) by Akbari (2023) (Appendix B).

Results Discussion

In order to answer the research questions of this study, the mean and standard deviation of both groups were calculated. The descriptive statistics of the questionnaire pre-test are presented in “Table1”.

Table 1-Descriptive Statistics of Two Group's Scores on the Student Engagement Questionnaire Pre-test

Group	N	Mean	SD	Std. Error Mean
Experimental	48	13.033	1.804	.329
Control	48	12.650	1.468	.268

“Table1” is a display of the mean and standard deviation of the experimental ($\bar{x} = 13.03$, $SD = 1.80$) and control ($\bar{x} = 12.65$, $SD = 1.46$) groups on pre-test of engagement questionnaire. “Table 2” below reflects the result of independent *t*-test that was carried out to compare the engagement questionnaire scores of experimental and control groups on the pre-test of engagement questionnaire. As it is evident from the table, the significance level (.17) associated with Levene's test was more than .05 implying that the assumption of equality of variances is met.

Table 2-Independent Samples Test for Two Groups' Scores on Student Engagement Questionnaire Pre-test

Levene's Test for Variances			T-test for Means			
Factor	<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>df</i>	Sig. (2-tailed)	Mean Diff.



Equal variances assumed	1.925	.171	.902	58	.371	.383
Equal variances not assumed			.902	55.703	.371	.383

As a glance at “Table 2” shows, *t*-value and significance level ($t(58) = .90, p = .37, p > .05$) are indicative of no significant difference in engagement scores for experimental ($\bar{x} = 13.03$) and control ($\bar{x} = 12.65$) groups on the pre-test. In fact, the *t*-observed is below the *t*-critical of 2.00; thus, the students in the two groups had approximately the same level of engagement at the beginning of the study. “Table 3” reflects the mean and standard deviation of the experimental ($\bar{x} = 14.66, SD = 1.42$) and control ($\bar{x} = 13.48, SD = 1.50$) groups on post-test of engagement.

Table 3-Descriptive Statistics of Two Group's Scores on the Student Engagement Questionnaire Post-test

Group	<i>N</i>	Mean	<i>SD</i>	Std. Error Mean
Experimental	48	14.667	1.428	.260
Control	48	13.483	1.499	.273

The results of independent *t*-test that was performed to compare experimental and control groups' engagement scores on the post-test are set forth in “Table 4”.

Table 4-Independent Samples Test for Two Groups' Scores on Student Engagement Questionnaire Post-test

Levene's Test for Variances				T-test for Means			
Factor	<i>F</i>	Sig.	<i>T</i>	<i>Df</i>	Sig. (2-tailed)	Mean Diff.	
Equal variances assumed	.006	.939	3.129	58	.003	1.183	
Equal variances not assumed			3.129	57.862	.003	1.183	

A cursory look at “Table 4” indicates that the assumption of equal of variances is met ($p = .93, p > .05$). Additionally, independent *t*-test found a statistically significant difference ($t(58) = 3.12, p = .003, p < .05$) in engagement measures for the experimental group ($\bar{x} = 14.66$) and control group ($\bar{x} = 13.48$).



Also, the *t*-observed was below the *t*-critical of 2.00. Accordingly, the researcher rejected the first null hypothesis that states, “gamification framework has no any significant effect on Iranian primary school learner’s engagement” and claimed that gamification framework affects Iranian primary school learner’s engagement. The purpose of the second research question was to find out if gamification framework has any significant effect on Iranian primary school learner’s phonics alphabets acquisition. The researcher ran independent sample *t*-test for investigating this research question. According to “Table 5”, the two phonics alphabets pre-test scores for both experimental group ($p = .92, p > .05$) and control group ($p = .96, p > .05$) have normal distribution. Moreover, the phonics alphabets post-test scores for both experimental group ($p = .53, p > .05$) and control group ($p = .84, p > .05$) enjoy normal distribution. Hence, the researcher was justified to apply independent samples *t*-test and paired samples *t*-test as two parametric statistical tests in this study.

Table 5-One-Sample Kolmogorov-Smirnov Test of Normality for Phonics Alphabets Scores

Time	Group	N	Kolmogorov-Smirnov Z	Sig. (2-tailed)
Pre-test	Experimental	48	.529	.921
	Control	48	.399	.967
Post-test	Experimental	48	.805	.536
	Control	48	.613	.844

As “Table 6” represents, the mean and standard deviation of the experimental ($\bar{x} = 2.66, SD = .32$) and control ($\bar{x} = 2.59, SD = .29$) groups on phonics alphabets pre-test.

Table 6-Descriptive Statistics of Two Group's Phonics Alphabets Scores (Pre-test)

Group	N	Mean	SD	Std. Error Mean
Experimental	48	2.664	.323	.059
Control	48	2.594	.295	.053

Accordingly, there was no statistically significant difference in phonics alphabets scores for experimental ($\bar{x} = 2.66$) and control ($\bar{x} = 2.59$) groups on the pre-test, in which the *t*-observed was less than the *t*-critical (2.00). So, the researcher came to the conclusion that the students in the two groups have the same level of performance in phonics alphabets at the outset of the study. More, the researcher performed another independent *t*-test to compare experimental and control groups' phonics alphabets scores on the post-test “Table 7”.



Table 7-Descriptive Statistics of Two Group's Phonics Alphabets Scores (Post-test)

Group	<i>N</i>	Mean	<i>SD</i>	Std. Error Mean
Experimental	48	2.833	.215	.039
Control	48	2.643	.268	.049

“Table 7” represents the mean and standard deviation of the experimental group ($\bar{x} = 2.83$, $SD = .21$) and control group ($\bar{x} = 2.64$, $SD = .26$) on the post-test of phonics alphabets. According to “Table 8” below, the significance level (.29) associated with Leven’s test is less than .05, so the assumption of equal of variances is met.

Table 8-Independent Samples T-test for Phonics Alphabets Learning (Post-test)

Levene's Test for Variances			<i>T</i> -test for Means			
Factor	<i>F</i>	<i>Sig.</i>	<i>T</i>	<i>Df</i>	<i>Sig.</i> (2-tailed)	Mean Diff.
Equal variances assumed	1.125	.293	3.035	58	.004	.19067
Equal variances not assumed			3.035	55.399	.004	.19067

As seen in “Table 8” above, independent *t*-test found a statistically significant difference ($t(58) = 3.03$, $p = .004$, $p < .05$) in phonics alphabets scores for experimental ($\bar{x} = 2.83$) and control ($\bar{x} = 2.64$) groups on the post-test, in which the *t*-value of 3.03 is below the *t*-critical of 2.00. Subsequently, the second null hypothesis of the study that says “gamification framework has no any significant effect on Iranian primary school learner’s phonics alphabets acquisition” was rejected, and therefore the researcher can claim that gamification framework influences Iranian primary school learner’s phonics alphabets acquisition.

In this study, gamification framework was investigated. The results revealed that the gamification framework had a positive effect on Iranian primary school learner’s engagement and phonics alphabets acquisition as a whole, in contrast with other studies (Pho & Dinscore, 2015; Manzano, Camacho, Guerrero, Guerrero, Aguilar, Trigueros, & Alias) which focused on the mechanics of gamification framework. Accordingly, the researcher rejected the first null hypothesis that states, “gamification framework has no any significant effect on Iranian primary school learner’s engagement” and claimed that gamification framework affects Iranian primary school learner’s engagement. In terms of their engagement, the experimental group based on the questionnaire shown better results in proportion to



control group. Subsequently, the second null hypothesis of the study that says, “gamification framework has no any significant effect on Iranian primary school learner’s phonics alphabets acquisition” was rejected, and therefore the researcher can claim that gamification framework influences Iranian primary school learner’s phonics alphabets acquisition. Moreover, our research is supported by El Tantawi et al., who inspected the influences of applying gamification framework on Saudi Arabian university students. Their findings discovered a significant enhancement in students’ academic writing skills that was ascribed to the use of gamification.



Conclusions

This study aimed at investigating the effect of using mechanics, dynamics and emotions gamification framework on Iranian primary school learners' engagement and phonics alphabets acquisition. The learners in the experimental group who benefited from gamification framework outperformed the control group. The results revealed that the gamification framework had a positive effect on Iranian primary school learner's engagement and phonics alphabets acquisition. The current research results are in accordance with Fithriani, who investigated the effects of gamified vocabulary learning in a mobile-assisted language environment on Indonesian adult EFL learners' vocabulary learning. His results showed that the students in the EG outflanked their counterparts in the CG. Additionally, our study is advocated by Abusa'alek and Baniabdelrahman, Waluyo and Bucol, Rashid Al- Eqabi, and Mohammed Alnoori, who confirmed the positive effects of using games on developing learning English in different contexts.



References

- [1] Akbari, S. (2023). Development of a questionnaire for assessing primary students' perceptions of the learning environment. Master's thesis, *Islamic Azad University, Tehran, Iran*.
- [2] Assaf, T. (2010). La place des jeux traditionnels dans l'EPS : analyse socio-historique de 1891 à nos jours; le cas de la Gironde . Available:<http://www.theses.fr/2010BOR21708> (current May 2019)
- [3] Buckley, P., & Doyle, E. (2016) Gamification and student motivation, interactive learning environments, 24:6, 1162-1175, DOI: 10.1080/10494820.2014.964263
- [4] Byrne, R., & Fielding-Barnsley, M. (1989). Pronunciation improvement in EFL young learners through phonics instruction. *Praxis, 12*, 52-62.
- [5] De Graaff, G., Angelova, N., & Yordanova, L. (2009). Gamification in education. *Proceedings of 9th International Balkan Education and Science Conference, 21(1)*, 32-39.
- [6] Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. *Proceedings of the AAAI Workshop on Challenges in Game AI*.
- [7] Kapp, K. (2012). *Two types of gamification*. Retrieved 05 16, 2018, from <http://karlkapp.com/two-types-of-gamification>.
- [8] Manzano, A., Camacho, P., Guerrero, M., Guerrero, L., Aguilar, J., Trigueros, R., & Alias, A. (2021). Between Level Up and Game Over: A Systematic Literature Review of Gamification in Education. *Sustainability, 13(4)*, 2247.
- [9] Martin, J., & Bolliger, A. (2018). *User's guide and toolkit for the surveys of student engagement: The High School Survey of Student Engagement (HSSSE) and the Middle Grades Survey of Student Engagement (MGSSE)*. <https://www.nais.org/articles/documents/member/2016%20hssereport-final.pdf>
- [10] Pho, A., & Dinscore, A. (2015). *Game-based learning. Tips and trends*. Washington DC: Spring Publications.
- [11] Piaget, J. (1952). *Play, Dreams and Imitation in childhood*. New York: W. W. Norton & Company.
- [12] Roy, V., & Zaman, B. (2018). Need-supporting gamification in education: An assessment of motivational effects over time. *Computers & Education, 127*, 283-297. doi:10.1016/j.compedu.2018.08.018
- [13] Sheridan, N., Howard, J., Alderson, D. (2011). *Play in Early Childhood*. Routledge, London.
- [14] Villaume, S., & Brabham, E. (2003). Phonics instruction: Beyond the debate. *International Reading Association, 56(5)*, 3478-482.
- [15] Werbach, K., & Hunter, D. (2012). *For the win: how game thinking can revolutionize your business*. Philadelphia : Wharton Digital Press.



Appendices

Appendix A-Observation Checklist

Scale	Statement	Never		Sometimes		Always	
		1	2	3	4	5	
E	1. Pays attention in class						
E	2. Works well with other children						
I	3. Attempts to do his/her work thoroughly and well, rather than just trying to get by						
D	4. Acts restless, is unable to sit still						
I	5. Participates actively in discussions						
E	6. Completes assigned seatwork						
D	7. Needs to be reprimanded						
D	8. Annoys or interferes with peers' work						
E	9. Is persistent when confronted with difficult problems						
N	10. Doesn't seem to know what is going on in class						
N	11. Is withdrawn, uncommunicative						
E	12. Approaches new assignment with sincere effort						
I	13. Asks questions to get more information						
D	14. Talks with classmates too much						
N	15. Doesn't take independent initiative, must be helped to get started and kept going on work						
E	16. Tries to finish assignments even when they are difficult						
I	17. Raises his/her hand to answer a question or volunteer information						
E	18. Gets discouraged and stops trying when encounter an obstacle in schoolwork, is easily frustrated						

Notes: E= Effort; I= Initiative; D= Disruptive behavior; N= Inattentive behavior



Appendix B-Student Engagement Questionnaire in School (SEQS)

Statements	Very High 0	High 1	Moderate 2	Low 3	Never 4
1. How excited are you about going to your classes?					
2. How often do you get so focused on activities in your classes that you lose track of time?					
3. In your classes, how eager are you to participate?					
4. When you are not in school, how often do you talk about ideas from your classes?					
5. Overall, how interested are you in your classes?					
6. What are the most engaging activities that happen in the class?					
7. Which aspects of class have you found least engaging?					
8. If you were teaching class, what is the one thing you would do to make it more engaging for all students?					
9. How do you know when you are feeling engaged in class?					
10. What projects/assignments/activities do you find most engaging in the class?					
11. What does this teacher do to make this class engaging?					
12. How much effort are you putting into your classes right now?					
13. How difficult or easy is it for you to try hard on your schoolwork right now?					
14. How difficult or easy is it for you to stay focused on your schoolwork right now?					
15. If you have missed in-person school recently, why did you miss school?					