

Exploring the Impact of Game-Based Tasks on the Motivation of Military Personnel Learning Pashto

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Abstract

The role of motivation in second language learning is undisputed. Simply put, motivation is what keeps learners learning. Language instructors need to find ways to engage students who appear disinterested and unmotivated, and to maintain the motivation levels of those who at the beginning of study appear highly driven to master the language.

Maintaining the student motivation levels is particularly challenging for teachers of less commonly taught languages (LCTLs). Anecdotal evidence suggests that students' perceptions of how demanding it is to learn a language may provoke anxiety and negatively affect their motivation to learn (Damron & Forsyth, 2012; Jordan & Walton, 1987; Saito-Abbot & Samimy, 1997; Samimy & Tabuse, 1992), or they may get demotivated once they realize the amount of time and effort required to achieve the learning goals (Damron & Forsyth, 2012; Ueno, 2005; Wen, 1997).

In this study, we set out to investigate whether creating a gamified language assessment activity for the military personnel learning Pashto could have a positive effect on their language learning experience and prove a worthwhile addition to their language training.

The next sections provide a brief overview of the Self-Determination Theory of motivation and its application in the L2

classroom, a short review of studies focusing on military students as foreign language learners, and a review of studies on the effect of games and game-like activities on L2 learning outcomes.

1. Self-Determination Theory

The Self-Determination theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000) has established itself as one of the leading explanations of what drives human learning and has been used to investigate motivation in formal classroom settings. According to SDT, the accomplishment of learning goals comes about through a complex interplay of intrinsic and extrinsic motivations.

Intrinsic motivation refers to doing an activity for the simple pleasure of it, and it is associated with feelings of competence and autonomy. This type of motivation has been found to lead to high-quality learning, as well as enhanced performance, persistence, and creativity (Ryan & Deci, 2000, p. 55). For example, intrinsically motivated L2 learners may enjoy learning a language because they love learning about the L2 community (cf. *integrative motivation*; Gardner & Lambert, 1972), they feel a sense of accomplishment or satisfaction when grasping a difficult L2 construct, or they love hearing the second language being spoken by native speakers (Noels et al. 2000, p. 85).

A number of factors can facilitate or undermine intrinsic motivation. For example, unexpected positive feedback and encouragement can facilitate intrinsic motivation, because they can help people feel more competent; conversely, negative feedback can undermine one's sense of competence and desire to learn. A number of studies on English learners of Arabic, for example, have shown that the lack of satisfaction with their own results, or the lack of success on proficiency tests can be detrimental to their desire to continue with the language study (Elkhafaifi, 2005; Husseinali, 2004; Nichols, 2010).

Extrinsic motivation refers to external factors for engaging in an activity, such as reward systems, grades, or the opinions we fear others might have of us. However, extrinsically motivated behaviors differ with respect to the degree of self-determination associated with them.

A person could be learning an L2 in order to get a better job or a better salary, or they can engage in L2 learning because they feel it is good for their personal development. In the former case, once the external goal has been accomplished, there would be no more reason to continue with the language study (cf. *instrumental motivation*; Gardner & Lambert, 1972). In the latter case, however, external motivation can positively affect learning outcomes as learners realize the value of language learning to achieving personally relevant goals (Noels et al. 2000, p. 62).

Research has shown that intrinsic motivation or highly internalized forms of extrinsic motivation lead to better learning outcomes than motivation regulated by external factors. Noels et al. (2000) measured the motivation of 159 English university students learning L2 French and found that the more internalized the reason for learning a language, the more persevering the students seemed to be in their studies. Ramage (1990) found that discontinuing high-school students of French and Spanish were less motivated to learn the language for language's sake than continuing students. Tachibana, Masukawa, and Zhong (1996) found that the increased intrinsic motivation of Japanese learners of L2 English was related to the greater likelihood of them achieving high test scores.

Since many of the classroom activities are not inherently fun or enjoyable, Noels et al. suggest that the key to sustained learning is to persuade students to see the value or importance of language learning and to feel personally involved (2003, p. 52).

2. Members of US military as language learners

The US Military comprises a specific group of LCTL learners who often study languages critical to the US missions abroad. Many of these languages are classified by the Defense Language Institute as Category III or IV languages¹, which means they may in and of themselves be demotivating for learners because of their perceived complexity.

Additionally, these learners very often start off with low levels of intrinsic motivation: they may not have any previous language learning experience, they may not have a desire to connect to the target culture, and they may feel like they have no choice when it comes to language learning. Moreover, their other military duties often leave little time for language study (Bott, 1995). Additionally, according to Nichols (2010:179), many do not realize the importance of language study until after having been deployed, or even until critical moments of their deployment, indicating low levels of personal involvement in the language training.

However, very little research has been done on the motivation of the enlisted US military personnel engaged in LCTL study. Nichols (2010) investigated the motivation of the members of the US military learning Arabic: the learners had already been deployed in Iraq, and their desire to study the language once back in the US was partly tied to their real-life exposure to the target

¹ If a language is classified as a Category III or IV language, this indicates that the average amount of time needed for an English native speaker to reach a certain level of speaking proficiency in that language is considerably higher than the time required to achieve the same level of proficiency in one of the Romance or Germanic languages.

language and culture. A much earlier study by Johnson (cited in McNeil-Cho, 2013) found that the military personnel with more years of formal education and higher ranks performed better than those with fewer years of formal education or of lower rank.

Unlike other LCTL learners, such as heritage learners or college level learners who, at least in the initial stages of language learning, appear to be highly motivated, many enlisted members of the US military start their language training with low levels of intrinsic motivation and may not, at least initially, see the L2 study as personally relevant.

Thus, the onus remains on the instructors to find ways to motivate such learners and increase the chance of positive learning outcomes. One way of doing it is to try and “lighten the load” by creating tasks and activities that can appeal to the L2 learners’ innate desire for fun and play. In this study, a game-based language assessment activity, different from traditional type of classroom tasks, was designed to this effect.

3. Gaming and motivation

The use of games or game-like activities in education has significantly expanded over the last decade as educators try to capitalize on the way that gaming environments seem to engage players, who do not appear to be motivated by any rewards or benefits outside the game environment (Cornillie, Thorne, & Desmet, 2012, p. 2; Deterding, Dixon, Khaled & Nacke, 2011, p. 2; Ryan, Rigby, & Przybylski, 2006).

In the area of L2 learning the general consensus has been that digital games can support L2 acquisition because they involve students in playful learning (Hubbard, 1991; Prensky, 2001), and they increase motivation (Baltra, 1990; Carrier, 1991; Hubbard, 1991; Li & Topolewski, 2002), collaboration (Ballou, 2009), and positive affect (García-Carbonell, Rising, Montero, & Watts, 2001).

However, few studies have actually measured the changes in student motivation or their L2 proficiency goals (Cornillie et al., 2012, p. 6; Tobias, Fletcher, Dai, & Wind, 2011, p. 206), and they have done so with mixed results. Liu & Chu (2010) found that a context-aware ubiquitous game designed specifically for L2 English learners had a significant positive effect on the learning outcomes and motivation of students who used it, as opposed to students who used a non-gaming approach (printed materials and CDs).

On the other hand, Cornillie and Desmet (2013) and deHaan, Reed and Kuwada (2010) focused on specific game elements and found that they do not necessarily lead to better language learning outcomes, nor are they always perceived by learners as being helpful. In a study on L2 English vocabulary acquisition using a video game, De Haan et al. (2010) found that, contrary to their expectations, the Japanese university learners who merely watched the game recalled significantly more vocabulary than the students who played the game. They concluded that the physical interactivity of the game represented extraneous cognitive load that diverted players' attention from the vocabulary.

Cornillie and Desmet (2013) investigated the effect of feedback that Dutch players experienced when playing games designed to promote self-sustained English L2 learning. If learners made a mistake, they were presented with one of three types of feedback: 1) plain corrective feedback – a red “X” with a sound effect; 2) corrective feedback with elements of fantasy, and 3) vivid corrective feedback which contained animations. In the interviews, the learners revealed that they preferred corrective feedback with elements of fantasy, but without animations which many found distracting.

Both of the above studies suggest caution in assuming that gamifying tasks will always lead to increased performance and advise prudence when incorporating games into the language classrooms.

The aim of this study was to design a fun, enjoyable activity different from traditional classroom exercises and elicit the military students' reaction to it. The activity was gamified and interactive; it provided instant feedback; the students were not graded or scored on it; it was supposed to bring an element of playfulness to the classroom, and help learners revise and assess their target language and culture knowledge both before the final exam and after the end of the course. The learners' reaction to the activity and their levels of motivation while completing it were to be used as a test of whether including such activities would benefit the military staff attending LCTL courses.

4. Method

The gamified assessment activity was developed specifically for the members of the US military attending the intensive courses in Pashto at the Language Training Center (LTC) housed within the San Diego State University (SDSU).

4.1 Participants

The participants in the study were all members of the US Marines Corps attending an 8-week intensive elementary Pashto course designed to bring the learners to the 0+ proficiency level of the Interagency Language Roundtable (ILR)². This means that after eight weeks, learners, who start off with no L2 knowledge, should be able, among other things, to successfully handle uncomplicated communicative tasks in straightforward social situations, with conversations pertaining to personal and immediate needs and preferences. They should also be able to handle basic situations within the military context, such as giving orders to a driver or an

² This level corresponds to the Novice High level of proficiency on the ACTFL scale.

incoming pedestrian at a check post, collecting basic information while patrolling an area or during a house search, etc.

All the Marines who take the course are expected to be deployed to Afghanistan within six months following its completion, with the usual wait time being between six weeks and four months. Before the start of the course, students are asked to fill out a survey asking them, among other things, about their linguistic and educational background, whether they have ever been to Afghanistan, whether they have ever used Pashto, as well as their perceptions of Afghans and Afghanistan.

Each week, students are administered an online knowledge quiz. At the end of week 4 and week 8 they take a midterm and a final exam respectively. Each quiz, including the exams, consists of a number of traditional test-item types: multiple choice questions, matching, fill-in-the-blank exercises, sentence completion, sentence and paragraph translation, as well as open ended questions relating to the Afghan culture.

During the study, a total of 34 marines took the elementary Pashto at the SDSU LTC. All were male and had similar educational backgrounds, with only four having a higher education degree. Twenty-one students had previously been deployed to Afghanistan for a period of five to seven months, while thirteen students had never been there.

When asked about their perceptions of Afghanistan, the majority emphasized the cultural differences between Afghanistan and the US. Most of those who had already been deployed left comments about poverty, low education, and the simplistic way of life in Afghanistan. A few students emphasized the negative side of their Afghan experience, describing Afghans as disrespectful or dishonest, ignorant, or simply stating that they did not like them.

However, a couple of comments described Afghans as creative, devoted to family, humble, and generous. None of the comments seemed to suggest that the students were approaching the study of Pashto with the desire to establish a connection with the target culture or the target language population.

In addition to the pre-course survey, the students are asked to fill out a fully anonymous post-course questionnaire. In our study, 23 students (67% of all students) responded to it. Of those who responded, 61% rated their motivation to learn the language as high, 78% had a positive language learning experience, and 57% felt they made significant progress in terms of understanding the language since the start of the course. However, 48% of those who responded felt they struggled as learners, even though all the students achieved at least the target 0+ level of proficiency on the IRL scale, with 11 scoring even higher (1, corresponding to the ACTFL Intermediate Low to Intermediate Mid level of proficiency). This echoes earlier studies on Arabic learners who continued feeling dissatisfied with their ability to use the L2 even after making progress (Elkhafai, 2005; Hussein, 2006).

The results of the post-course survey seem to suggest that the majority of those who responded had a positive learning experience. However, those who responded to the questionnaire might have been more motivated in the first place than those who declined to respond. It is simply impossible to guess at the motivation levels of those who chose to remain silent.

4.2 The Gamified Assessment Task

Despite the students' reported positive learning experience and high levels of learning motivation, the experience of LTC Pashto instructors has been that students do not continue the language study once the course is over. In order to address this issue, a summative assessment activity with gaming elements was designed to boost the

student enjoyment while on task. The activity tested their knowledge of Pashto language and culture that they had covered in the weeks prior to the assessment, and it was administered a few days before the final exam in week 8.

The aim of the study was to measure the levels of language learners' motivation and enjoyment while completing the gamified activity. It was presented to learners as a review activity to help them determine the areas of weaknesses they needed to work on. While the students knew they would not be graded, the hope was that they would see it as an opportunity to go over the course material and prepare better for the final assessment.

4.3 Activity Development and Design

The gamified activity was created using the Articulate Storyline platform. The game's main character (the player) is an intern at the US Embassy in Kabul competing for the position of the Pashto Language and Culture Advisor. In order to earn the job the player must obtain four letters of recommendations from four embassy staff members, who present the player with visually rich challenges. In order to overcome these challenges, the players must demonstrate understanding and knowledge of the Afghan language and culture.

The gamified activity includes material from every week and theme of the curriculum. The four challenges by the embassy staff members represent four levels of the game. After completing all levels, the player wins the game by earning the permanent position at the US Embassy. The game is publicly available at <https://larc.sdsu.edu/pashto-larc/#pashtoonline>

4.3.1 The game mechanics.

The gaming elements are intended to engage the learners, and include levels, badges, points, challenges, game loop, progress indicators, and feedback.

As mentioned earlier, the game consists of four levels which are sequential: there is no skipping or free navigating, and the students have to pass one level to unlock the next. The complexity and difficulty of the language required to complete the tasks increases with each level, and the story develops in a linear fashion.

At the end of each level, if they have accumulated a sufficient number of points, the players get a letter of recommendation; each letter represents a form of badge they need to compete for the job at the Embassy.

In order to earn the badge, the players have to collect a sufficient number of points by choosing the linguistically and culturally appropriate responses in conversations with Afghans. Each question is a timed multiple choice task with four options: the players have 45 seconds to provide the correct answer. They can accumulate additional points by playing the vocabulary challenges, most of which are in the form of drop and drag exercises.

If players fail to provide the correct response to five conversation segments they have to restart the level.

The players can see the progress indicator at all times: the number of points they have already gained, the number of questions and challenges remaining, and the number of questions that they could not provide the correct answer to within the allocated time.

The players are given feedback for each conversational segment. For easier questions within the level, the feedback is simple

(“correct,” “that's not right,” “almost there,” “try again”), accompanied by a visual marker. For harder questions, the feedback is more complex, and designed to lead the players to the correct answer. For example, in a segment where the players are asked where they are from, one of the options is the incorrect “I live in Kabul.” The feedback to this response is “That's interesting, I live in Kabul, too. But I asked you where you are from, not where you live now.” The feedback was not animated to reduce student distraction (Cornillie & Desmet, 2013).

4.4 Study Design

Students were randomly assigned to one of three groups: the control group (12 students) and two experimental groups (11 students each).

The three groups completed different versions of the activity. The control group completed a non-gamified version which lacked the game mechanics, though it contained the same images, storyline, and the feedback as the gamified version. The experimental groups completed the gamified assessment activity with all the game mechanics as described above. Additionally, the players within one of the experimental groups could see how they ranked among their fellow players after completing the activity: the competitive element was added with the idea of further boosting the fun on task. All three groups completed the same final exam.

The amount of time students were given to play the game was one hour: this was due to logistical and practical reasons, rather than being required by the nature of the game. The students were told they should complete as much as of the activity as they could within the given hour, and complete the rest at their own leisure.

4.5 The Motivation Questionnaire

All students were asked to fill out two identical motivation questionnaires, one after the review activity and one after the final exam. The questionnaires were administered online via theSurveyMonkey online platform.

The questionnaires contained 27 seven-point Likert scale type items, intended to measure the student motivation while completing the activities. For each of the statements presented, the students were asked to indicate how true the statement was for them (see Appendix A).

The questionnaire scales measured student interest and enjoyment (seven items), perceived competence (five items), perceived value of the activity (seven items), and effort and importance (eight items). The items comprising the first three scales were taken from the Intrinsic Motivation Inventory (IMI) developed by Ryan and Deci <http://www.selfdeterminationtheory.org/intrinsic-motivation-inventory>), and the last scale combined some IMI items with the items from the Student Opinion Scale (SOS) developed by Sundre (2007).

The Interest scale items measured the pure intrinsic motivation. The Perceived Competence scale was included because it is deemed to be a positive predictor of intrinsic motivation.

The Perceived Value was included because of the idea that if people find certain activities useful they are more likely to complete them willingly. The Effort/Importance scale was included because it has been argued that students are less likely to invest effort in activities they do not find important. The items comprising the Effort/Importance scale focused more on the importance of scores, while the Perceived Value scale focused more on the general value of the activity for the purpose of learning L2 Pashto.

All students were asked to fill in the questionnaires immediately upon completing the gamified assessment activity and the final exam.

4.6 Hypotheses

1. The intrinsic motivation while on task will be higher for students taking the review assessment with gaming features than for those taking the non-gamified version of the assessment activity.
2. The difference in motivation between the review assessment and the final exam will be greater for students taking the gamified version than for those taking the non-gamified version of the review assessment.

5. Results

Thirty out of 34 students completed the motivation questionnaire after the review assessment, and 24 students completed the questionnaire after the final exam: only 22 students completed both questionnaires. Therefore, only the responses obtained from these 22 students were used to investigate the second hypothesis. On the other hand, the responses from all the students who completed the motivation questionnaire after the review assessment were taken into account when investigating the first hypothesis in order to obtain the most robust data analysis.

The small sample size and its limiting effect on the generalizability of the results are addressed in the conclusions section of the paper.

5.1 Scale Reliability

The Cronbach's alpha coefficient was used to check the internal reliability of the questionnaire scales: the value of 0.70 or

higher was considered adequate, while values above 0.80 desirable. The Interest, Perceived Value and Perceived Competence scales all had the Cronbach's alpha value of 0.90 or higher on both administrations of the questionnaire³. The Cronbach's alpha value of the Importance/Effort subscale was above 0.80 on both administrations of the questionnaire.

5.1.1 Hypothesis #1:

In order to test the hypothesis that students find the gamified review activity more fun or enjoyable than the non-gamified version of the same activity, the analysis centered on the mean motivation ratings on the first questionnaire, completed immediately after the gamified review assessment. In this case, the responses of all the students who completed the questionnaire (N=30) were analyzed.

The control and experimental groups made relatively similar ratings with values converging around or just above the midpoint for most of the scales (see Figure 1). The experimental group I had the highest rankings on all the scales except for the Perceived Competence scale, while the mean ratings of the experimental group II were the lowest of all. Since sample sizes were small and data were not normally distributed, a Kruskal-Wallis test was performed on the mean ratings of the three groups. The H test values for each scale and their associated probabilities indicated no statistically significant differences between the groups (see Table 1).

³ This was the case when the scales were analyzed taking into account all of the student responses, as well as only the responses of 22 students who completed both questionnaires.

5.1.2 Hypothesis # 2:

In order to test the second hypothesis, only the responses from 22 students who completed both questionnaires were analyzed. The expectation was that, for the experimental groups, the levels of intrinsic motivation (but not necessarily of effort/importance) while on task would drop between the two assessments.

Since the number of students in the two experimental groups who completed both questionnaires was fairly low (4 from Group 2 and 7 from Group 3), and since no statistical difference on any measures of test-taking motivation was found between them, the results from these two groups were collated.

The mean motivation ratings increased perceptibly between the review assessment and the final exam for both groups on all the scales except for the Interest scale, on which there was minimal change between the two questionnaires (see Figures 2 and 3). Since the sample size was small, and given that the data were not always normally distributed, the statistical test used was the Wilcoxon Signed-ranks test.

The analysis of the control group ratings showed no statistically significant differences between the ratings on the Interest and Perceived Value scales (see Table 2). However, the Perceived Competence and the Effort/Importance scale ratings among the control group participants were statistically significantly higher on the final exam than on the review activity.

Unexpectedly, the analysis of the experimental group ratings revealed an increase in ratings for all the scales between the two questionnaires (see Table 3). The increase was statistically significant for the Perceived Value and Effort/Importance scales.

6. Discussion

Contrary to expectations, the study found no statistically significant effect of the gamified language activity on the level of student intrinsic motivation while on task. The main finding appears to be that all the students, whether part of the control or experimental groups, seemed to see the final, traditional-style assessment as more valuable and important than the game-like assessment, and they felt more competent while completing it.

The Effort/Importance scale ratings increased significantly for both the control and the experimental groups from the gamified activity to the final assessment. The scale items focused primarily on the importance of grades: since the review activity was not graded, and the final assessment was, this finding is not entirely unexpected.

However, the Perceived Value ratings indicate that the experimental group found the final exam to be more valuable than the gamified assessment. The Value scale items focused on the activity's overall usefulness in aiding the language learning. It was somewhat surprising that the experimental group participants felt the traditionally oriented assessment to be more valuable: a question remains whether the students saw the 'value' of the final assessment simply as being necessary for the course completion, an element missing from the gamified assessment.

Additionally, both groups rated their perceived competence to be higher on the final assessment than on the gamified assessment: the difference was statistically significant for the control group. This is an important finding, as perceived competence has been found to be a high predictor of intrinsic motivation.

Since the study did not include any post-activity interviews with students, it is hard to determine with certainty the reason behind these results. We speculate that the students were simply more

familiar with the format of the traditional exam: they completed a number of similar assessments throughout the course, they felt more at ease completing the types of questions they were familiar with, they thus felt more competent, and enjoyed the experience more.

Also, while the language covered in the gamified assessment was familiar to the students, they were novices who had just learnt a new script and whose level of proficiency was around novice high or, at best, intermediate low on the ACTFL scale: it is not inconceivable that the lack of familiarity with the new activity format could have introduced additional cognitive load, slowed down the speed at which they interpreted the questions and answers, and affected their perceived competence.

Furthermore, students in the experimental groups could have felt frustrated by some of the gaming elements themselves. An informal conversation with some of them revealed that while most enjoyed the story, the visuals, and the cultural questions, a few felt frustrated at having been forced to restart the level after accumulating a certain number of wrong answers, or being timed while answering the questions. Even though these comments were not collected in any systematic fashion, they do shed light on issues facing instructors who embark upon creating gamified activities while being constrained in terms of technological and other resources. Small language departments have to be prepared to change, tweak, and adjust their gamified products to achieve the desired effect without cognitively taxing the novice learners in any inopportune ways.

And while students did not *not enjoy* the review activity (after all, their mean questionnaire ratings tended to revolve around the scale midpoints) it is possible that they saw it as an unnecessary addition to an already busy finals week: they were obliged to have a go at the activity, while being aware that, apart from providing additional practice, it would not count towards their grades.

7. Conclusion

The results of this study serve as a cautionary tale to those who embark upon creating gamified L2 activities for their LCTL students. Even when an activity is designed specifically to boost the motivation while on task, it may achieve little effect, especially if it is perceived to be of low value or too demanding. In this study no post-activity interviews were conducted with the students, although in hindsight, it appears that, at least with this type of exploratory studies, interviews could have revealed the reasons behind some of the ratings.

As it is, we speculate that the absence of the anticipated effect may have been caused by the lack of familiarity with the activity format, and the low levels of perceived competence while completing it may have created the situation in which the students' sense of involvement and motivation diminished.

An important caveat is that the data have been obtained from a relatively small sample size of students and analyzed using less powerful nonparametric tests, thus limiting the generalizability of the results to a wider student population. However, despite the sparsity of active learners of Pashto in the US, the LCTL instructors working with enlisted military personnel may be well advised to reflect on these findings before designing gamified activities for their students. Continuing the research with different groups of military learners studying a variety of critical languages will shed more light on the main drivers behind their language learning success.

Another obstacle to the generalizability of the study results is the fact that the student population described in this paper is different from other, non-military, learners of Pashto, such as college or heritage learners. While the post-course questionnaire responses indicated high levels of motivation, none of these students chose to study Pashto of their own free will; rather they were required to do

so. Thus, they may have been motivated primarily by the desire to complete the course and achieve the required grade, without wish to go “beyond the call of duty” and engage in activities that, even though they could help expand their language knowledge, were not part of the course requirement. Conducting a similar follow-up study with students who approached the L2 study of their own free will might shed more light on whether these results are limited only to our specific student demographic.

As it is, the results indicate that designing gamified activities for LCTLs in military settings must be approached with caution and no expectations of immediate results. The considerations of student proficiency level, their expectations of the course, and their comfort zone, all play an important role in in the way the classroom activities are viewed in terms of their relative importance and value.

7.1 Tables

Table 1: *Differences in Motivation Levels among Student Groups during Gamified Activity*

Motivation predictor scales	Mean ranks			Kruskal-Wallis H test (<i>p</i> value)
	Control group (n=12)	Experimental group I (n=11)	Experimental group II (n=11)	
Interest	16.82	16.55	12.72	1.29 (0.52)
Value	16.55	17.40	12.11	1.96 (0.37)
Competence	16.14	14.80	15.50	0.12 (0.94)
Effort/Importance	15.82	17.55	12.83	1.39 (0.50)

Table 2: *Differences in Control Group Motivation Levels between the Review Assessment and the Final Exam*

Motivation predictor scales	Mean ranks		Wilcoxon Signed-ranks Z test (p value)
	Review assessment	Final exam	
Interest	5.00	4.29	-0.62 (0.53)
Value	5.00	5.71	-1.11 (0.27)
Competence	4.20	4.60	-2.27 (*0.02)
Effort/Importance	4.38	5.13	-2.05 (*0.04)

Table 3: *Differences in Experimental Groups Motivation Levels between the Review Assessment and the Final Exam*

Motivation predictor scales	Mean ranks		Wilcoxon Signed-ranks Z test (p value)
	Review assessment	Final exam	
Interest	3.43	4.00	0.67 (0.50)
Value	3.29	4.86	2.51 (**0.01)
Competence	4.00	4.20	1.59 (0.11)
Effort/Importance	3.88	4.75	2.81 (**0.01)

7.2 Figures

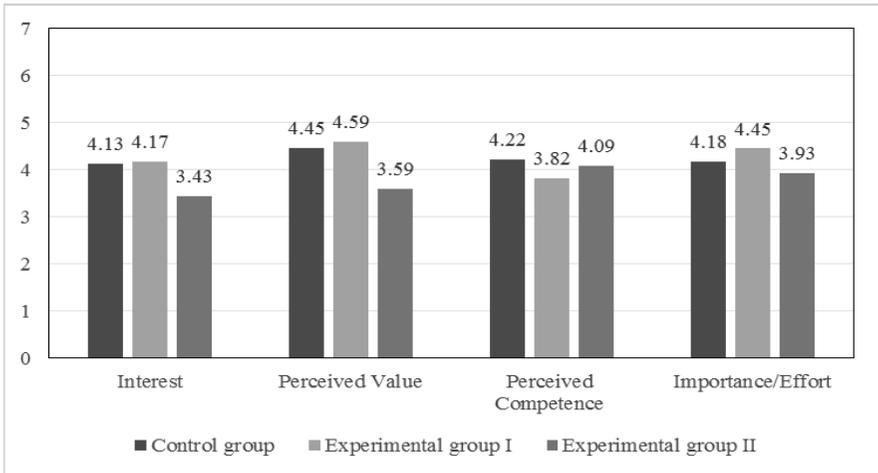


Figure 1. Mean motivation ratings on the gamified assessment as reported in Questionnaire 1.

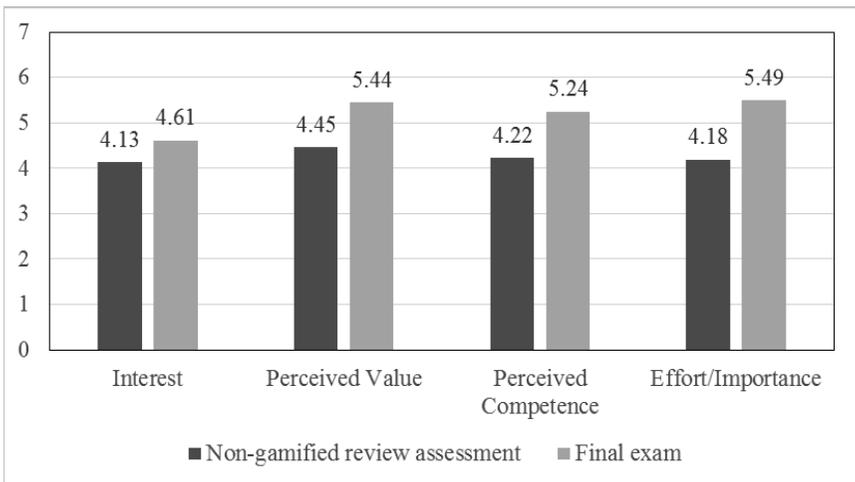


Figure 2. The control group mean motivation ratings on the review assessment and final exam, as reported in Questionnaires 1 and 2 respectively.

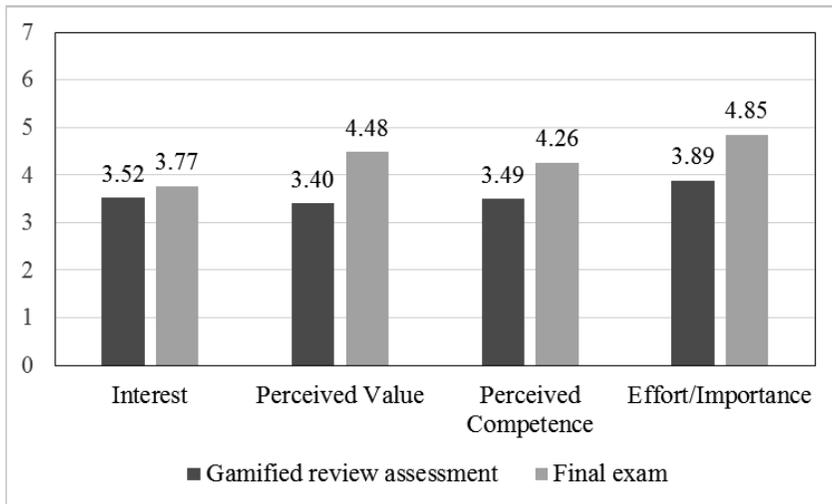


Figure 3. The experimental groups mean motivation ratings on the gamified review assessment and final exam, as reported in Questionnaires 1 and 2 respectively.

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Appendix A

For each of the following statements, please indicate how true it is for you, using the following scale.

1	2	3	4	5	6	7
Not at			Somewhat			Very
all true			true			true

1. This activity was fun to do. (Interest)
2. I gave my best effort on this activity. (Effort/Importance)
3. Doing well on this activity was important to me.
(Effort/Importance)
4. While I was doing this activity, I was thinking about how much I enjoyed it. (Interest)
5. I think doing this activity could help me learn Pashto better.
(Perceived Value)
6. I believe doing this activity could be beneficial to me.
(Perceived Value)
7. I enjoyed doing this activity very much. (Interest)
8. After working at this activity for a while, I felt pretty competent. (Perceived Competence)
9. I would like to know how well I did on this activity.
(Effort/Importance)
10. This activity did not hold my attention at all. (Interest)
11. I believe this activity could be of some value to me.
(Perceived Value)
12. This was an important activity to me. (Effort/Importance)
13. I think I am pretty good at this activity (Perceived Competence)
14. I think this activity is important to do because it can help me learn Pashto better. (Perceived Value)

15. I tried very hard on this activity. (Effort/Importance)
16. I didn't put much energy into this. (Effort/Importance)
17. I think I did pretty well on this activity, compared to other students. (Perceived Competence)
18. I am not concerned about the score I receive on this activity. (Effort/Importance)
19. I thought this was a boring activity. (Interest)
20. This was an activity I couldn't do very well. (Perceived Competence)
21. I would be willing to do this again because it has some value to me. (Perceived Value)
22. I am satisfied with my performance on this activity. (Perceived Competence)
23. I think this is an important activity. (Perceived Value)
24. While doing this activity, I could have worked harder on it. (Effort/Importance)
25. I would describe this activity as very interesting. (Interest)
26. I think that doing this activity is useful for learning Pashto. (Perceived Value)
27. I thought this activity was quite enjoyable. (Interest)