Effects of Gamification as a Micro Learning Tool on Instruction

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ABSTRACT

Gamification is a technique in teaching and learning that helps the learner to get the benefits of electronic technology to understand the course material, thorough playing the game or game based principles integrated with the course material. This way of learning increases the motivational level of learner, which in turn enhances the engagement and understanding with the subject material. Micro learning is a new-fangled technique of learning, to deliver the content of the subject in small chunks. This research study has merged the Micro Learning technique with Gamification, as a new learning methodology and has revealed the effects of Gamification as a Micro Learning Tool on instruction with in a Blended Learning setup of instruction. Total number of participants for this study was 28, and divided in two Groups; those had studied an IT course. First group ('A') was the experimental group, supported with an Online "Microsoft Word Ribbons" Game, provided as an additional Micro Learning Tool, along with face-to-face instruction, to practice their course module. This group ('A') had used their computers, laptops, mobile or portable devices to use the online game, as a Micro Learning tool. Second group ('B') was a control group thathad attended traditional face-to-face instruction, only. This research study has analyzed the effects of Gamification technique, through these two groups, by comparing their exam results of the studied module. Furthermore, the participants of experimental Group 'A', those had used the gamification technique were studied through a survey questionnaire for two stages, **Before** and **After** the use of online game, regardingtheir attitudes toward the new tested methodology. Plain statistical comparisons have been made on thefeedback of Group 'A' for **Before** and **After** stages. Outcomes of this study are of great interest for the researchers, connected with the use of Gamification and Micro Learning technique in instruction.

Key words: *Blended Learning, Gamification,Instruction, Micro Learning, Participants Attitude*

1. INTRODUCTION

Education is a practice of conveying the knowledge to a learner in gaining the awareness and understanding, and to develop the skills that enables the learner to understand the world, beyond their suburbs and surroundings. Generally, this process of gaining the knowledge is through traditional methods, like books, face-to-face traditional teaching and learning methods, etc. Good practices can be used or introduced to increase the interest of learners, and to maximize the learning outcomes, and skills.

Traditional face-to-face learning is a process, where an instructor teaches a course, and generally, the duration of lecture ranges from 1 to 2 hours or sometimes the teaching and learning activities are from morning to evening, and during these lengthy lectures or timings, every so often, it's difficultfor the instructors to create in depth conceptions, and to cover the huge amount of teaching material. As a result, instructors try to repeat the ideas, frequently, at later stages, and the outcome is a course that gradually escalates and goes out of control, without the development of in-depth ideas, which results in compromised learning outcomes.

There are two approaches in practice; traditional face-to-face instruction, and technology driven-instruction. Some educational institutions are still using the traditional teaching methods, based on teacher-controlled disciplined classrooms, chalk and talk mode of teaching, where the emphasis has been given on the preparation of exams and results, instead of focusing on the conceptual understanding of the topics, however, the new method of instruction is also available, that is based on technology-driven teaching and learning classrooms, where the importance is on conceptual understanding of the topics and many more (Noor, 2014). Today, the traditional face to face instruction has been integrated and replaced with emerging technologies in education.The additional use of electronic communication tools with conventional face to face mode of teachingis positively affecting the process of learning and learners understanding (Ahmad, Al-Khanjari, 2011). The communications through electronic tools in combination with Micro Learning technique leaves positive effects on the learning outcomes (Ahmad, 2017; Ahmad, 2017). Educators and learners are utilizing the electronic communication tools, along with conventional face-to-faceinstruction (Auster, 2016). Skills of the learners' can be improved through integrating the face to face instruction with blended learning (Nazarenko, 2015). Blended learning is a mixture of diverse learning practices, integrated with traditional face to face mode of instruction (Giarla, 2016). Blended learning is a practice to improve the learning outcomes and skills of learners, through combination and integration of learning methods with traditional face-to-face learning (Joanna, 2013). Following are the key elements to assess the performance of any electronic communication tool: - is the e-tool '**Comfortable**'? - is it considered as an **important** or **essentia**l part of learning process? – is it **friendly** while using? – does the e-tool help in **understanding** and **learning** toward the particular goals (Ahmad, Al-Khanjari, 2011; Ahmad, Al-Khanjari, 2016; Ahmad, 2017; Ahmad, 2017).

2. WHAT IS GAMIFICATION AND MICRO LEARNING?

Gamification is a method in education that motivates the learner and increases their engagement toward the learning content by integrating the game design principles along with course contents, with in a learning environment (Dichev, & Dicheva, 2017). Micro Learning is a learning process based on small units those are easily acceptable and consumable (Fernandez, 2014). A process of learning through small divisions of the learning contents and related activities based on focused and short duration is called Micro Learning(Hug, 2005).The communication through micro or small size content results in Micro learning (Mosel 2005). Micro Learning is a novel technique where the process of learning is through the use of learning content in small size, and is very beneficial for the improvement of skills and knowledge (Minimol, & Habil, 2012). Micro Learning is a technique that positively affects the process of learning, produces optimistic results, and creates a friendly and comfortable environment (Ahmad, 2017).Micro Learning is a method of instruction that produces progressive outcomes on learning and skills, supportive in the concepts creation, and helpful in learning and understanding the topics (Ahmad, Al-Khanjari, 2016). Micro learning produces extremely helpful results for learning and understanding the course materials (Ahmad, 2017).

3. PURPOSE OF STUDY

The purpose of this study was to introduce and new learning methodology, through integrating an online Game (Gamification), with the course material, used as aMicro Learning Tool, as an additional support to the learning process, along with face-to-face teaching, with in a blended learning setup, and to evaluate the effects of Gamification as a Micro Learning Tool on the learners' exams results, attitudes, help of Gamification in understanding and learning the contents of the course, and likings of the learners.

4. METHODOLOGY

This research study has tested the effects of gamification as a Micro Learning tool on instruction, with in a blended learning setup, where the course contents of an IT course (Basic Computing Skills) for the Module "Microsoft Word", a module based on practical activities were merged using the Micro Learning technique, and integrated with an online game (gamification technique). Total number of participants was 28, and divided in two groups. Group 'A' was experimental group, supported with an Online Game for Microsoft Word(PurposeGames, 2017), provided as an additional learning and practice to their course, along with face-to-face teaching, whereas, and Group 'B' was a control group, those had attended face-to-face lectures, only. This online game had 51 questions related with the subject area, and the attempt of using the game was divided in small chunks as a micro learning technique; participants were specially informed and emphasized to play the online game for 5 minutes only, and were asked to reattempt the game after a break of at least two hours. This game had questions related with the course material, a timer, percentage of overall completion, counting of correct and wrong answers in numbers, right and wrong replies with different colors, and the numbers of reaming questions. The game was asking questions and the participant had to choose the answer through the mouse selection, from the available options, among variety of answers, from the MS word Ribbons. At every restart, questions were appearing in a random order. Minimum-recorded time to solve those 51 questions was 5 minutes. Participants had used computers, laptops and their mobile devices, and tried their best, at every new attempt, to solve maximum number of questions with correct answers within 5 minutes.

This research study has analyzed the effects of Gamification, through these two groups, by comparing their exam results of the studied subject module. Furthermore, the participants of Group 'A', those had used the Gamification technique, were studied through a survey questionnaire for two stages, **Before** and **After** the use of online game. The questionnaire was based on 5-points Likert Scale, from 1 to 5, where 1. Strongly Disagree. 2. Disagree, 3. Uncertain, 4. Agree, 5. Strongly Agree, concerning student attitudes toward the e-tool;Friendly, Comfortable, Essential, Help, of e-tool in Understanding andLearning the contents of course module, and Help of e-tool in the Preparation of Exams, and liking of participants towards the mode of instruction.Plain statistical comparisons based on the statistical means have been made on the participants' feedback for **Before** and **After** stages.

5. RESULTS

5.1. ASSESSMENT OF EXAM RESULTS(GROUP 'A' VS GROUP 'B')

The Group Means (Averages) of the exam results, for the experimental group 'A' and control group 'B' are available in Table 1, and Fig.1.Statistics indicate that the experimental group 'A' that was supported with Gamification as a Micro Learning tool with in a blended learning setup, along with face-to-face instruction, had improved exam results having a group Mean of (17.98) marks, out of 25; however, control group 'B' with traditional face-to-face teaching received a group Mean of (14.28), and the difference of group means between these two groups was 3.7, that is equal to 14.8%. These results reveal that the Gamification as a Micro Learning tool within a Blended Learning setup has helped group 'A' to attain better exam results.

| Table 1: Comparison of Exam Results – Group Means (Group 'A' Vs Group 'B')	
Exam Results (Total Marks of the Exam Module: 25)	
Group A (Experimental Group): Supported with Gamification as a Micro Learning tool	**Group B (Control Group):** Traditional face-to-face instruction without using Gamification as a Micro Learning tool
Group Mean – Group 'A'	**Group Mean - (Group 'B')**
17.98	**14.28**
Mean difference = results of Group 'A' – results of Group 'B' Mean difference = 17.98 - 14.28 = 3.7 Conversion of Mean difference in Percentage=>3.7 (out of 25) = 14.8%	
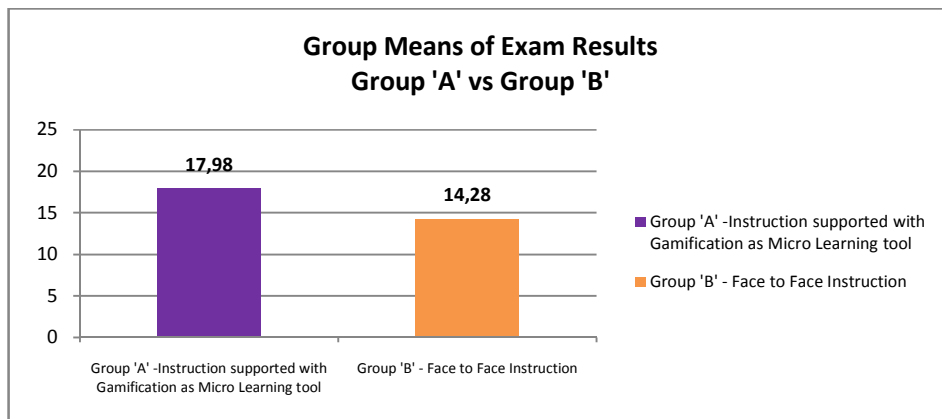
Fig. 1. Group Means of Exam Results – Group 'A' Vs Group 'B'

5.2. ATTITUDE TOWARDSTHE GAMIFICATION AS A MICRO LEARNING TOOL (GROUP 'A')

The group Means of the experimental Group 'A' towardsGamification as a Micro Learning tool at the Before and After stages can be seen in Table 2, and is available in Fig. 2. The figure and table clearly shows that the Means (Averages) of the dependent variables "Friendly", "Comfortable", and "Essential" were rated low at the beginning, however, after using the e-tool, participants rated all of them by higher means, with a size of change by (2.07), (2.07), and (2.64), respectively. Therefore, it has been proved that the learners had acknowledge and recognized the use and benefits of Gamification as a Micro Learning tool for instruction, within a blended learning setup, and verified this e-tool as Friendly, Comfortable, and Essential.

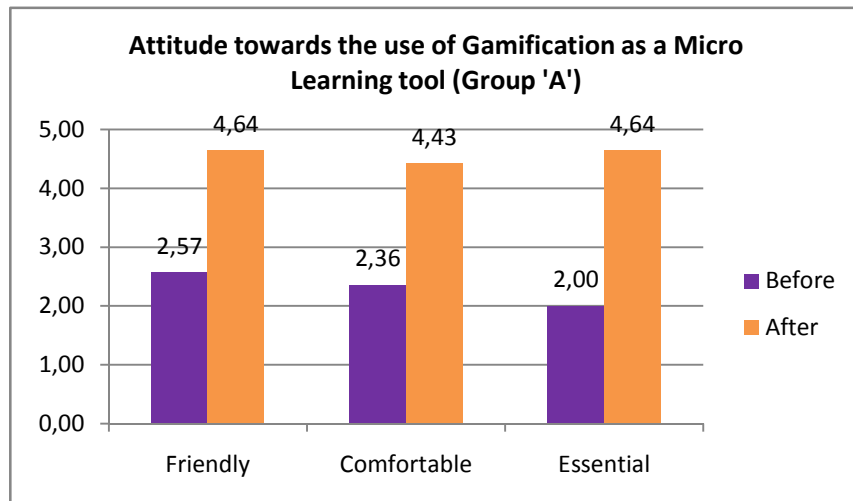| Table 2: Attitude towardstheuse of Gamification as a Micro Learning tool (Group 'A')			
	Mean		Size of Change
Dependent	Before	After	After-Before
Friendly	2.57	4.64	2.07
Comfortable	2.36	4.43	2.07
Essential	2.00	4.64	2.64

Fig. 2. Attitudes towardsthe useof Gamification as a Micro Learning tool – (Group 'A')

5.3. UNDERSTANDING, LEARNING, HELP IN EXAMINATION TOWARDS THE USE OFGAMIFICATION AS A MICRO LEARNING TOOL (GROUP 'A')

The data of Table 3 reveals the Group Means of Group 'A', and can be seen that the rating at Before stage was very low, whereas, participants had rated the Group Means at very high value at After stage, with a size of change (2.57), (2.14), (2.14) for the dependent variables "Understanding", "Learning" and "Help in Exam Preparation", respectively. This data proves that Gamification as a Micro Learning Tool has positively affected the dependent variables. Theparticipants had admitted that Gamification as a Micro Learningwas supportive and helpful in understanding and learning the course contents. The graphical analysis can be seen in Fig. 3 for the experimental group 'A'.

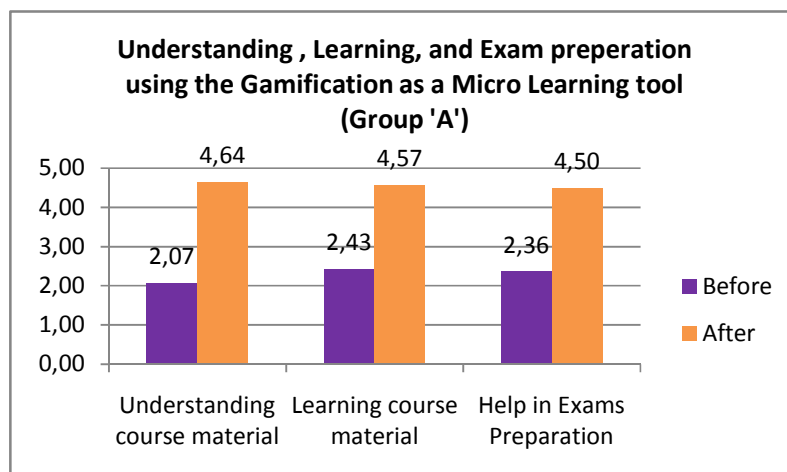| Table 3: Understanding, Learning, Help in Examination towardsthe use ofGamification as a Micro Learning tool (Group 'A')			
	Mean		Size of Change
Dependent Variables	Before	After	After-Before
Understanding course	2.07	4.64	2.57
Learning course material	2.43	4.57	2.14
Help in Exams Preparation	2.36	4.50	2.14

Fig. 3. Understanding and Learning using Gamification as a Micro Learning tool - (Group 'A')

5.4. LIKING OF PARTICIPANTS (METHOD OF INSTRUCTION) – GROUP 'A'

The Group Means (Average) of the experimental Group 'A', for their likings toward the **Method of Instruction** can be seen in table 4, and graphical analysis is available in Fig. 4. Participants' of Group 'A' hadrated very low at the beginning, whereas, after using Gamification as a Micro Learning Tool, participants rating was very high for the dependent variable "Instruction through Instructor & supported with Gamification as a Micro Learning Tool" with a big size of change (2.29). Therefore, it has been verified that participants of Group 'A'had identified Gamification as a beneficial Micro Learning Tool, with in a blended learning environment.

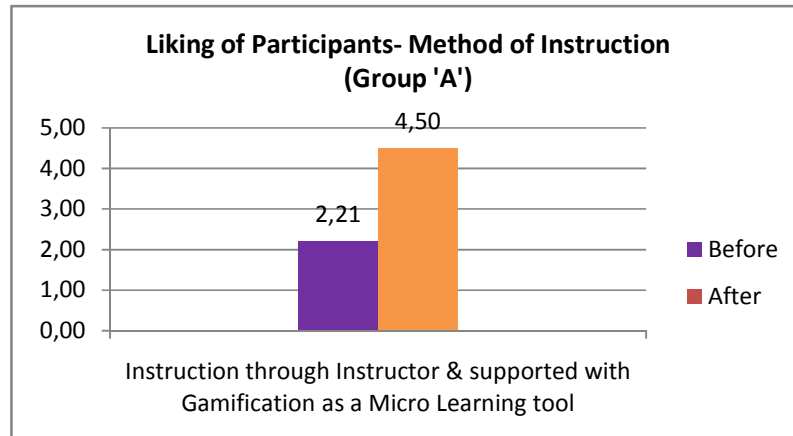| Table 4: Liking of Participants (Method of Instruction) – (Group 'A')			
	Mean		Size of Change
Dependent Variable	Before	After	After - Before
Instruction through Instructor & supported with Gamification as a Micro Learning Tool	2.21	4.50	2.29

Fig. 4. Liking of Participants– Method of Instruction using Gamification as a Micro Learning tool - (Group 'A')

After using the Gamification as a Micro Learning Tool within a blended learning setup, the results of examinationfor the experimental Group 'A' were improvedwith an overall percentage of 14.8%. The participants' attitudes of the experimental Group 'A' towards the dependent variables'**Friendly', 'Comfortable'** and '**Essential'** were very positive (with a size of change by 2.07, 2.07, and 2.64, respectively), and their rating towards the key areas'**Understanding'**, '**Learning'** and '**Help of tool in Exam preparations'** was also very positive(with a size of change by 2.57, 2.14, 2.14, respectively). Participants had rated the method of instruction through instructor and supported with Gamification as a Micro Learning Tool with a huge size of change by 2.29.

6. SUMMARY AND CONCLUSION

The results of this study reveal that the use of Gamification as a Micro Learning Tool within a blended learning setup positively effects the results of exams, learning outcomes, and overall process of instruction. Gamification provides a comfortable and friendly environment for learning that helps the learner to develop detailed ideas and concepts about the course contents with better understanding and learning, in small-bites and chunks, and in short steps.Use of Gamification along with face-to-face teaching is beneficial by using it as a Micro Learning tool, through dividing the contents or activities in Micro parts, as it delivers the course contents through small steps, with tiny pieces of contents.

Hence, Micro Learning is a process of learning where tiny pieces of learning contents, distributed in small portions and steps,help the learner in understanding, and learning the course contents. Moreover, Micro Learning helps in creation of detailed ideas and concepts about the topics, using small division of contents in small steps, and optimistically affects the exam results and learning outcomes with in a friendly and comfortable environment.

Consequently, the integration of Gamification as a Micro Learning Tool within a blended learning setup is a positive adaptation that enriches the overall learning outcomes and produces improved results. Dear educators, what are you waiting for; Gamification as a Micro Learning Tool is marvelous, with lots of benefits on learning outcomes. Don't wait any longer,add the value; and start integrating the Gamification as a Micro Learning tool with your courses, as an

enhanced solution to resolve the issue related with your lengthy sessions of instruction, for detailed concepts creation, and increase the ratio of learners understanding, for better outcomes.

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