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Influence of Gamification Elements on Emotion, Interest and Online Participation

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Abstract

With the development of technology, digital games have now been favored by a growing number of people. This increase in the popularity of digital games is mostly associated not only with the interesting designs of the digital games but also with the emotional satisfaction with these games. In recent years, this tendency towards digital games has led to the transfer of certain features of games to non-game contexts. The concept named gamification refers to the adaptation of game features to non-game contexts. Gamification has been in use in many areas in recent years. One of these areas is the field of education. Therefore, the present study aimed to examine the effectiveness of elements of gamification in blended learning environments within the context of emotion, interest and online participation. In the study, the convergent parallel mixed design, which allowed explaining the quantitative and qualitative data in association with each other, was used. In this respect, the study was carried out with 63 university students (30 students in the experimental group and 33 students in the control group) in a period of 13 weeks. In the research process, the two groups of students were provided with the opportunity to experience the blended learning environment both on face-to-face basis and on online basis. The experimental group differed from the control group in terms of such gamification elements presented in face-to-face and online environments as being given directives, progress bar, badge, level, experience point, leaderboard, award, completion rate, activity completion, activity restriction and activity feedback. According to the data collected in the study, gamification elements used in blended learning environments have caused the participants to develop both positive and negative emotions. In addition, it was revealed that gamification was found interesting by the participants Moreover, it was seen that there was a significant difference between the times spent by the groups in terms of their participation in online environment in favor of the experimental group. In addition, it was found that award, competition, level, badge and restriction were influential on the students' participation in online environment.

Keywords

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Introduction

Gamification has a very important place in the nature of living beings. Almost all living beings play games with their peers and parents in the process of learning and adaptation to the outer world. In this process, the pleasure with games has direct influence on the time spent on playing (Williams, Yee, & Caplan, 2008). Games, which contribute to other living beings' learning to a great extent, can be associated with different factors in the case of the human. There are various reasons for humans' behavior of playing games. People play games to test their skills, to challenge others, to enjoy their strength and luck, to have an exciting and relaxing experience and to feel different feelings and emotions that are not related to their school (Lazzaro, 2004). On the other hand, digital games have been increasingly popular in recent years with their advantages such as increasing one's motivation (Gee, 2003), facilitating learning (Clark, Tanner-Smith, & Killingsworth, 2016), increasing social interaction (Hera, Loos, Simons, & Blom, 2017) and providing an entertaining environment (Sabourin & Lester, 2014; Tüzün, 2007). These positive effects of digital games can be adapted to non-game contexts, which allows gamification.

According to Deterding, Dixon, Khaled, and Nacke (2011), gamification is the use of game elements in non-game contexts. The most comprehensive definition of gamification has been provided by Kapp (2012, p. 10) as "use of game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems". Therefore, gamification can be regarded as use of such compelling features of games as badges, experience points, leaderboard and level in none-game contexts. In literature, various elements of gamification have been mentioned (Karataş, 2014). However, points, badges, achievement records, leaderboard and level are among the most popular elements in gamified environments (Lister, 2015). In order for gamers to know what they do in games and why do so (Marczewski, 2015), the goals are explicitly set in games (Kapp, 2012). For this reason, the role of each element in a gamified environment, the goals, the tasks and the functioning of the gamified environment should be clarified. In addition, the scoring system is influential on such cases as monitoring the progress in gamified environments, management of awards, winning the badges and the leaderboard (Marczewski, 2015), and participants are awarded (Kapp, 2012). For this purpose, the *experience point* is used to monitor individuals' progress in gamified environment and to award them. The *leaderboard*, another element used in gamified environments, has an important function in facilitating learning and in encouraging learners (Zichermann & Cunningham, 2011). This element is influential in terms of feedback as it allows participants to view their positions instantly in the gamified system (Marczewski, 2015). Also, thanks to the *level* system, the gamer is provided with feedback regarding the experience they gained in the game (Kapp, 2012), and individuals can monitor their progress in the gamified system (Werbach & Hunter, 2012). Another element frequently used in gamified environments is the awards. According to the behaviorist, it is pointed out that awards are effective in reinforcing individuals' behaviors (Werbach & Hunter, 2012). Badges, regarded as a kind of award, can be defined as virtual rewards (Zichermann & Cunningham, 2011) or as icons that appear on participants' profile pages if they accomplish the previously assigned tasks (Werbach & Hunter, 2012). Marczewski (2015) states that badges as well as course grades have an important place in recording academic achievements in online environments. The reason is that badges are not objects distributed free; in contrast, they are virtual rewards obtained via a certain effort or achievement (Zichermann & Cunningham, 2011). For this reason, badges are used not only to award participants' behaviors but also to determine their positions in the gamified environment (Zichermann & Cunningham, 2011).

For the purpose of supporting gamers in games and encouraging them to demonstrate the intended behaviors, feedback is an effective method used in games (Kapp, 2012; Werbach & Hunter, 2012; Zichermann & Cunningham, 2011). In this respect, thanks to such feedback, gamers can be informed instantly about their correct or wrong behaviors (Kapp, 2012). Such elements in gamified environments as the experience point, level and progress bar can be used as a tool to provide feedback.

Emotion

Emotions, motivation, cognitive state and socio-cultural structure are taken as variables in designing gamified teaching, and all these variables make learning entertaining (Plass, Homer, & Kinzer, 2015). Within the scope of this, it could be stated that individuals' learning is influenced by their emotional states (Tauber, Dunlosky, Urry, & Opitz, 2017). Emotions could not only increase individuals' motivation to learn but also involve disincentives (Dirkx, 2001; Leutner, 2014). In addition, it is pointed out that emotions occur as a result of individuals' interaction with their environment and provide feedback regarding whether their expectations have been met or not (Meyer & Turner, 2006). According to a study carried out by Izard (2010), there are 34 different definitions of emotion in related literature due to the complex structure of the concept of emotion, and it is seen that these definitions mention physiological, psychological, cognitive, behavioral and social dimensions. For this reason, it could be stated that individuals' emotions are not constant and can be influenced and directed by these dimensions in the teaching process. In a study carried out by Becker, Goetz, Morger, and Ranellucci (2014), teachers' emotional states were found to influence those of students. In addition, it is reported that students' emotional states have a relationship with learning strategies (Meyer & Turner, 2006; Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011). Emotions are affected by teaching strategies in the teaching process, and they are fairly influential on supporting the interaction between the teacher and the student as well as on creating a positive class atmosphere (Meyer & Turner, 2006). For this reason, considering the fact that students' emotions are influenced by environmental factors, it could be stated that emotions should be taken into account by teachers as an important variable in the teaching process (Staus & Falk, 2017).

Several studies have been conducted to develop positive emotions in students in the teaching and learning process. In one study conducted by Plass, Heidig, Hayward, Homer, and Um (2014), well-designed multimedia materials were found to activate students' positive emotions and to contribute to their comprehension skills. In one other study, it was revealed that when individuals are pleased with the activities or when they feel positive emotions while doing these activities, they tend to do a better job (Durik, Shechter, Noh, Rozek, & Harackiewicz, 2014). Therefore, students' emotional states could be said to reflect upon their behaviors. For instance, when individuals feel angry, they are likely to demonstrate aggressive behaviors, or they may even vomit in the case of loathing (Fredrickson, 2004). In other words, individuals react, make decisions and learn within the framework of their emotional experiences (Shuck, Albornoz, & Winberg, 2007; Tyng, Amin, Saad, & Malik, 2017; Um, Plass, Hayward, & Homer, 2012; Watanabe, Sakagami, & Haruno, 2013). It is quite important to activate students' positive emotions for the establishment of an effective learning environment. For this reason, it is seen that digital games, which have become increasingly widespread in the teaching process, help students feel more positive emotions (Sabourin & Lester, 2014). In addition, the value of the expectation for an award widely used in digital games is thought to be shaped depending on individuals' emotional interaction with that award (Delgado, Gillis, & Phelps, 2008). Therefore, use of game features in the teaching process could help establish an entertaining learning environment by creating a positive effect on students' emotional experiences (Dormann, Whitson, & Neuvians, 2013; Fitz-Walter, Johnson, Wyeth, Tjondronegoro, & Scott-Parker, 2017; W. Li, Grossman, & Fitzmaurice, 2012; Plass et al., 2015). Gamification allows making activities more entertaining in class and creating a positive class environment. For this reason, within the scope of the study, it is important to examine the effectiveness of gamification elements in terms of emotions.

Interest

Another variable influential on directing individuals' behaviors towards certain goals is the interest (Hidi, 2000; Renninger, 2000). Interest is a concept that helps individuals both develop their cognitive states and explain their future behaviors (Hidi, 2000). In literature, it is seen that interest has been classified as *situational interest*, *individual interest* and *topic interest* (Hidi, 2000; Hidi & Renninger, 2006; Renninger, 2000). Among these interest types, the situational interest is more open to arrangement, and it can thus be controlled with changes to be made in environmental conditions (Schraw & Lehman, 2001). In another saying, situational interest can be controlled partly with teaching strategies and with

the design of the tasks assigned by the teacher to individuals (Kang, Scharmann, Kang, & Noh, 2010). Situational interest does not have a constant structure (Rotgans & Schmidt, 2011). Therefore, they could be either high or low. High situational interest contributes positively to motivation (Hidi, 1990), while low situational interest could decrease students' personal interests and their interest in the topic as well as lead to attention deficit and low level of motivation (Hidi & Harackiewicz, 2000; Kopp, Mills, & D'Mello, 2016; Rotgans & Schmidt, 2017). Therefore, in order to increase learners' situational interest, there are various activities including organization of texts, presentation of interesting materials and problem-based learning (Knogler, Harackiewicz, Gegenfurtner, & Lewalter, 2015; Schraw, Flowerday, & Lehman, 2001). Another learning activity could be said to be digital games. In literature, related studies demonstrate that digital games provoke gamers' interests and help create an interesting learning environment (Denis & Jouvelot, 2005; Hung, Sun, & Yu, 2015; Prensky, 2001; Wideman et al., 2007). In one study carried out by Papastergiou (2009), it was found that thanks to games, students get more interested in the tasks assigned to them and that they perceive the learning process more appealing. In another study conducted by Chang, Hwang, Tsai, & Liang (2014), similar results were obtained, and it was revealed that the mobile competition game helped perceive the learning process to be more interesting. Therefore, as digital games are influential on interest, it is considered to be an important concept in gamification environments established with the use of features of games in non-game contexts. Also, gamification provokes individuals' interest (Barata, Gama, Jorge, & Gonçalves, 2013), and it is important to determine how gamification and gamification elements influence individuals' interests.

Online Participation

With the developing technology, learning occurs not only on face-to-face basis in class environment but also in out of class (Hrastinski, 2009). One of these environments is the online environment, which allows teachers and students to access the teaching materials independently of time and place (Garrison & Vaughan, 2007). As in face-to-face environments, students can participate in lessons in online environments. Online participation involves not just individuals' actions in online environment but their establishment of communication, interaction and connection with each other as well (Hrastinski, 2009; Lipponen, Rahikainen, Lallimo, & Hakkarainen, 2003; Weber, 2014; Zheng & Warschauer, 2015). In addition, online participation includes the time individuals spend on reading the materials in online environment (Huang, Lin, & Huang, 2012). In other words, learners' participation in online environment leads to learner-teacher, learner-content and learner-learner interactions as mentioned by Moore (1989). Moreover, when compared with the face-to-face environment, online environment has several advantages such as increasing the online interaction and the quality of discussions (Davies & Graff, 2005). Furthermore, online participation also reminds of online learning (Hrastinski, 2009). Despite this importance of online participation, studies (Lipponen et al., 2003) demonstrate that participants do not take part in online environments intensively. Massive Open Online Courses (MOOCs), which is one of online environments, shows that the ratio of learners who give up in the process is quite high (Conole, 2013; Kennedy, 2014). Therefore, various studies have been conducted to increase learners' online participation. In one study carried out by Sansone, Ligorio, and Buglass (2016), the students were provided with private course support to encourage students' active and constructive participation in online environment, and the results revealed that this kind of support increased the students' online participation. In addition, another study examined students' motivations regarding online participation using visualization tools, and it was found that the visualization tools motivated the students to participate online (Jin, 2017). Another method applied to increase online participation is gamify the online environment. Considering the fact that gamification increases students' participation (Barata et.al., 2013; Li Dong, Untch, & Chasteen, 2013; Lister, 2015), the present study experimentally examined the influence of gamification elements on online participation in blended learning environments, which make use of advantages of both face-to-face and online environments. Different from online learning, blended learning also allows experiencing face-to-face learning (Garrison & Vaughan, 2007). In addition, Tang and Byrne (2007), in their study, reported that blended learning was more influential on students' satisfaction than complete online learning.

Moreover, if supported by face-to-face environment, online environment could allow students to avoid social loneliness and to socialize in face-to-face environment (Brooks, 2010). Also, courses designed with blended learning could contribute to the development of a more powerful sense of community among students when compared to traditional or complete online courses (Rovai & Jordan, 2004). Therefore, in the present study, the purpose was to decrease weakness to be caused by gamification only in online environment by providing the participants with the opportunity to experience gamification both in face-to-face environment and in online environment.

In related studies, the relation between the concept of emotion and interest is explained in various aspects. Bye, Pushkar, and Conway (2007) have found a positive, significant and moderate relationship ($r = .57$, $p < .001$) between positive emotions and interest in the study conducted with 300 participants. In addition, some researchers define interest as an adaptable emotion that motivate individuals (Ainley, 2006; Izard, 2007; Sung, Vanman, Hartley, & Phau, 2016). Also, Hidi (2000) focused on this subject in terms of situational interest and explained situational interest an emotional state developed by the individual due to certain features of an activity or a task. In addition, Kintsch (1980) divided situational interest into two: emotional and cognitive. In line with these views, interest could be said to be a kind of emotional state. However, both emotions and interests are considered to be influential on individuals' behaviors (Fredrickson, 2004; Hidi, 2000). Therefore, it is seen that gamification, which is influential on the occurrence of entertaining learning experience, has effects on individuals' emotional states, on their interests and on their online participation. For this reason, in the present study, the purpose was to examine the effectiveness of gamification elements in blended learning environments within the context of emotion, interest and online participation. In line with this purpose, the following research questions were directed in the study:

1. What is the influence of gamification elements on participants' emotional states?
2. What is the influence of gamification elements on participants' interests?
3. What is the influence of gamification elements on participants' online participation?

Method

The research was conducted within 13 weeks. In this process, quantitative and qualitative data are collected simultaneously, and these data are explained in relation to each other. For this reason, the research is designed according to the Convergent Parallel Mixed Methods (Creswell, 2014).

Participants

The participants of the study were 63 freshman students (30 experimental, 33 control) at a faculty of education of a state university. The main reason for choosing freshman students as participants in the study was that freshman students have low levels of experience in and awareness of online learning. As the overall objective of the course of Information Technologies in Education I was to develop preservice teachers' skills and knowledge regarding computer sciences, the study was conducted within the scope of this course. Another reason for selecting this course was the consistency of the research topic and the application process with the objectives of the course.

In line with the basic purpose of the present study, the course of Information Technologies in Education I was initiated for two groups of students, and the participants were assigned to these two groups on random basis. In other words, each participant had the equal change to be placed in either group. Also, one of the two groups was determined as the experimental group and the other as the control group again on random basis. Therefore, while determining the participants in the study, the simple random sampling method was used (Fraenkel, Wallen, & Hyun, 2011).

The study was carried out with a total of 63 participants (30 in the experimental group and 33 in the control group). The numbers of the female participants were equal in both groups (n=8), and there were 22 male participants in the experimental group and 25 male participants in the control group. The participants' ages ranged between 18 and 27 with an average age of 19. In addition, a great majority of the participants did not have any experience in online learning. None of the participants in the

experimental group had online learning experience, while in the control group, there were only four participants with experience in online learning.

Data Collection Tools

The research data were collected via a rating activity, time spent in online environment, experience activity, semi-structured interviews and focus group interview.

Rating Activity

For the purpose of determining the perceived difficulty levels of the activities and the participants' emotions regarding the online activities, a rating activity was prepared, and the participants were asked to respond to the rating activity on weekly basis. The participants responded to a total of 13 rating activities each week. The rating activity included a single five-point Likert-type item to determine the participants' emotions regarding the course activities. In related literature, there are several studies showing that measurement with a single item can be as effective as measurements with multiple items (Bergkvist, 2014; Bergkvist & Rossiter, 2007; Diamantopoulos, Sarstedt, Fuchs, Wilczynski, & Kaiser, 2014; Hoeppner, Kelly, Urbanoski, & Slaymaker, 2011); Rossiter, 2002; Wanous, Reichers, & Hudy, 1997).

Considering the fact that individuals have varying emotions, the measurements regarding the participants' emotions were done in the first two weeks of the application process using the test-retest method as mentioned in related literature (DeVellis, 1991; Fraenkel et al., 2011) with the assumption that the participants' emotions would not change in this period of time. The two measurements were found to have a correlation of ,67 ($p<.001$).

The Time Spent

In order to determine the time spent by the participants in the online environment, the plugin of "block_configurable_reports" used to determine the time spent in Moodle - an e-learning environment was applied. This plugin allows obtaining data and creating time-based reports depending on the starting and ending times of an action taken by the user. The data collected with this plugin were transformed into the time unit of seconds, and the durations of the time spent by the participants in online environment were compared with respect to the experimental group and the control group. The time spent in online environment may not be defined precisely as required by the nature of online environment. However, in studies in related literature (Fung, 2004; Gibson, Lusoli, & Ward, 2005), the time spent by the participants in online environment was regarded as an indicator of online participation. Therefore, in the present study, the variable of time was used to define online participation.

Experience Activity

The qualitative data regarding the participants' experiences they gained on weekly basis in the blended learning process were collected via the experience activity. For this purpose, the participants' views about their own states of interest, emotion and satisfaction were revealed with this activity found in online environment. The experience activity was presented to the participants every week for 13 weeks with the help of a six-item semi-structured questionnaire form.

Interviews

In the study, the qualitative data were collected via the semi-structured interviews and focus group interview, and the semi-structured interviews were referred to as "interviews". In order to find answers to the research questions, face-to-face interviews were held with the participants. The participants in the control group were determined based on their level of online participation, and those in the experimental group were determined based on their experience point in online environment. In this way, the participants with the highest, moderate and lowest levels of participation in online environment were selected using the maximum variation sampling method, one of purposeful sampling methods (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel 2014). The interviews were held with a total of 41 participants from the experimental group (n=26) and the control group (n=15). During these interviews, a semi-structured interview form including questions regarding the

participants' emotions, interest, and online participation was used. The semi-structured interview questions in the form were as follows:

- What would you suggest to correct in the learning management system?
- What would you say about the features that interested you in the learning management system?
- How did you feel while using the learning management system?
- Could you explain how your motivation was in fulfilling the activities in the learning management system?
- What were the factors that encouraged your online participation in the learning management system?

The data collected with this data collection tool were recorded with two different audio-recorder devices. During the interviews, an audio of 6 hours 34 minutes 29 seconds was recorded for the participants in the experimental group, an audio of 2 hours 33 minutes 59 seconds was recorded for the participants in the control group, making an audio record of 9 hours 8 minutes 28 seconds in total. For the analysis of the data obtained via the interviews, the audio records were transcribed and stored and analyzed within their own contexts.

In the study, in order to determine the views of the participants in the experimental group, focus group interview was held. The purpose of this focus group interview was to ensure variety of the data source. This interview is considered to be the best way to obtain people's opinions through a structured group conversation in which information is solicited by the moderator (Vaughn, Schumm, & Sinagub, 1996). The focus group interview was held using 15 semi-structured questions in nine categories. During this interview, two warm-up questions were used to help the participants prepare for the interview. Following these warm-up questions, the interview was held with six participants focusing on emotion, interest and online participation. The focus group interview lasted 107 minutes.

Application

As the blended learning model was taken as basis in the study, the applications were carried out in face-to-face and online learning environments together. In the face-to-face environment, the applications included presentations and practical activities carried out by the lecturer on weekly basis in the computer laboratory, where there was one computer for each student. As for the online environment, it was accessible via Moodle, a learning management system, at any time of the day. Within the scope of the course of Information Technologies in Education I, the lesson units of Introduction to Information Technologies, Equipment, Software, Operating Systems, Internet applications in Education, Use of Word Processing Applications, Use of Spreadsheet Applications, Use of Presentation Software, Use of Web-Based Presentation Software were taught to the participants. In this respect, activities were carried out in the online environment parallel to the face-to-face lessons. The list of the activities in question can be seen in Appendix 1.

Within the scope of the study, two online classes were formed via Moodle. In these classes, a section of "general access", which the participants could reach at any time, was formed. This section included a social forum activity and instant messaging to ensure Moore's (1989) learner-learner interaction. Thanks to this social forum activity, the participants had the opportunity to interact with the other participants. In the first academic term of their freshman year, the participants took courses mostly regarding the profession of teaching and other courses related to cultural issues. In other words, they took a limited number of field-related courses. The only field-related course, for which the participants came together with their peers in the laboratory environment in their first academic term, was the course of Information Technologies in Education I. Therefore, there were limited interactions

between the groups in the application process. In addition, the fact that the lessons were taught at different class hours on different days in the experimental and control groups and that the communication tools were restricted between the groups in the online environments contributed to the decrease in the interactions between the two groups. In the online environments, online activities were carried out parallel to the face-to-face lessons. These online activities were prepared in a way to use various features of Moodle like forum, page, feedback, homework and examination. The online environment for the experimental group was enriched with gamification elements thanks to the plugins and other features of Moodle, while the online environment for the control group, no gamification element was used. Moreover, the experimental group participants' achievements in the online environment were awarded in the face-to-face environment.

In literature related to gamification elements, there are different classifications. The themes of the gamification elements used in the study were determined based on the study carried out by Karataş (2014). Figure 1 presents an overall look of the gamification elements used in the study and the interactions between these elements.

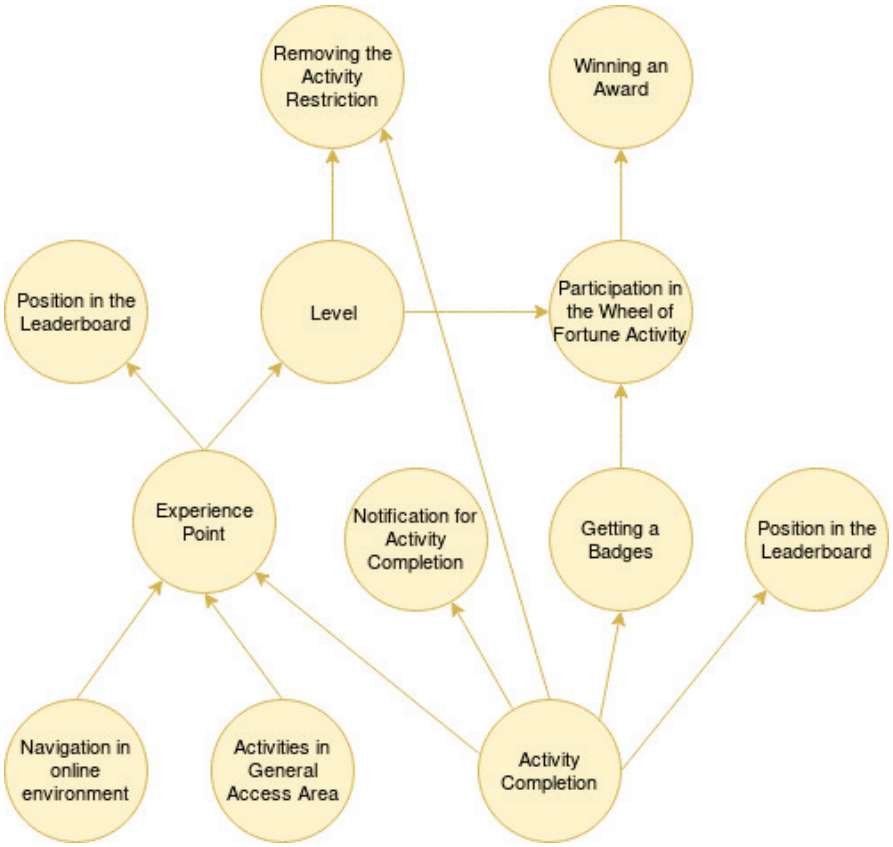

Figure 1. Interactions Between the Gamification Elements Taken as Basis in the Study

In a gamified environment, it should be clarified what participations will do and why (Kapp, 2012; Marczewski, 2015). For this reason, the functioning of the gamification elements and the things to be done by the experimental group participants were clarified using related directions.

In related literature, it is pointed out that user profile has an important place for awarding (Zichermann & Cunningham, 2011). Therefore, the user profile page was used to keep records of the participants' achievements in online environment and to let the participants access these records.

For the participants' experiences in online environment, Moodle's plugin of XP-Experience Point (block_xp) was used. With the help of this plugin, the participants' messages in the forums, their

activities and their surfing in online environment were scored. The participants received an experience score of 45 for any of their messages in online environment as consistent with the course objectives and received an experience score of 15 when read the messages and written texts. In addition, at most five actions taken by the participants in 60 seconds during their surf in online environment were evaluated. In addition, the actions regarding the same object or content were considered to be similar and thus were not scored. The participants received a score of 3 for their surfing in online environment. Participants were informed about scoring in the frequently asked questions of the LMS. However, the information about how many points are earned in order to avoid the tendency to continuously score points in the system is kept confidential. This is where all the participants' tasks are experienced. The experience score helped the participants increase their levels, go up in the leaderboard, get awards and obtain badges specific to the context.

In order for the participants to compare their own achievements with others', a leaderboard was formed depending on their points they got via the activities. In the leaderboard, the points obtained by the participants from the activities were taken into account, and their positions in the gamified environment were shown in this leaderboard. In addition, a separate leaderboard was formed as well based on the participants' completion of the activities in online environment.

In related literature, it is suggested that participants be provided with feedback regarding their experiences in gamified environment (Kapp, 2012) and that they be allowed to see their progress in the gamified environment (Werbach & Hunter, 2012). For this reason, in the experimental group, based on the experience point, the levels were formed, and when the participants reached an upper level, related feedback was instantly provided on the screen as suggested by Zichermann & Cunningham (2011).

Considering the fact that awards are influential on reinforcement of individuals' behaviors (Werbach & Hunter, 2012), the participants were given various awards based on the experience point, badges and face-to-face award activity so as to reinforce the experimental group participants' behaviors. In order to award the participants' behaviors and to inform them about their positions in the environment (Zichermann & Cunningham, 2011), various badges were given to those who completed the activities in a certain period of time. These badges were prepared and named according to certain rules within the context of the online activities. Among these badges, the participants winning the badge of wheel of fortune or those being the first to reach a certain level got the right to join the face-to-face award activity in face-to-face environment. In this activity, the participants won awards by chance within and out of the system thanks to the experiences they gained in the online environment.

For the purpose of providing instant, direct and clear information for the participants in the experimental group, they were given feedback not only regarding their experience point, level, badge and online experience but also regarding the activities via the progress bar, activity-reminding e-mail and activity completion.

Kapp (2012) points out that the restriction could be used to motivate gamers. In line with this view, the online activities were restricted based on the time, level and completion of the prerequisite activities specific to the context of weekly activities.

Data Analysis

The quantitative data collected in the study were analyzed using independent samples t-test. The assumptions of the t test were examined as described by Field (2013). Accordingly, it was seen that there was kurtosis (-,724) and skewness (-,364) in the experimental group and kurtosis (-,135) and skewness (-,891) in the control group. It was also found via Kolmogorov-Smirnov test (.05<p) that the data set demonstrated almost a normal distribution. In addition, the data were transformed into z score,

which was found to range between -3 and +3. This result was also consistent with Histogram, Q-Q Plot and Boxplot graphs.

After the qualitative data were analyzed separately in the context of each data source, of gathered from each data source, the data were gathered under a single roof and analyzed using content (inductive) analysis method. In the light of these data, the codes and themes were determined. In order to ensure trustworthiness of the qualitative data, various strategies were applied. In the study, since two researchers were involved in the research process, it was possible to take the views of more than one person. Therefore, the study was conducted within the framework of interaction and sharing based on cooperation between two different researchers, one of whom was the course teacher (second author) and the researcher (first author). The course teacher took a role in the planning of the course together with the researcher and taught the course in face-to-face environment. The activities in online environment were prepared by the researcher together with the course teacher in the preparation phase of the study. Also, for the planning and application of the research process, the course teacher's experiences were taken into account. The teacher took active role in executing the lessons in face-to-face environment as planned in the preparation phase of the study. The teacher executed the lessons using teaching methods such as question-answer, discussion, sample case, problem solving and expository teaching. Moreover, the teacher also contributed to the trustworthiness of the qualitative data by reporting views about the qualitative data, themes and codes obtained in the study.

The researcher helped prepare the technical sub-structure of the online learning environment, and in this process, the researcher selected an appropriate server, the domain name and the LMS. Within the scope of the study, the dedicated server was hired, and the researcher installed the operating system of Centos 6 on this server. In order for this server to run effectively and productively, the necessary settings were done in Apache and MySQL servers. Also, the researcher installed Moodle and did the necessary settings. In addition, the researcher formed the gamification elements in the preparation phase of the course. In this phase, the researcher transferred the gamification elements and online activities to LMS and the did the necessary tests. As the blended learning was taken as basis in the present study, the application phase of the study was carried out both in face-to-face environment and in online environment. The researcher took active part in the lessons in face-to-face environment together with the course teacher in the application process and took the participatory observer's role in this environment. Also, the researcher paid special attention to being objective to the two groups in both face-to-face and online environments.

In order to avoid and problems in the application process of the study, the researcher tried to take the necessary precautions against probable situations and to take instant action to solve any occurring problem. In the application process, the qualitative data were collected via the experience activities in online environment and via the interviews held with the participants by the researcher. In addition, the researcher conducted the backup and analysis processes regarding the data obtained via the experience activities. The researcher also held the interviews both during and after the application and analyzed the data gathered via the interviews. Starting from the last week of the application, the researcher took active role in collecting the quantitative data with the help of the related data collection tools. The qualitative data were also obtained via focus group interviews besides experience activities and interviews. The researcher took the moderator's role during the focus group interviews and helped these interviews to be held effectively and productively. Following these data collection procedures, the quantitative data and the qualitative data were analyzed.

In addition, as the research process lasted 13 weeks, in-depth data were collected during and at the end of the research process. The qualitative data sources were diversified with experience activity, interviews and focus group interview. While collecting the data, the notes taken down were examined by the participants, and they provided feedback regarding whether the notes stated what they had meant. In addition, the qualitative data collected by the researchers were re-coded by an expert from the field of education technologies, and the data were examined in terms of their appropriateness. In qualitative studies, intercoder consensus is expected to be at least 80% to determine internal consistency Miles and Huberman, 1994; Patton, 2002). For this purpose, the intercoder reliability was analyzed using the software of NVivo 11, and it was seen that ratio of intercoder consensus was at least 80,1%. Moreover, to ensure the validity and reliability of the qualitative data, the data, the codes and themes obtained were examined by two researchers expert in the field of education technologies. Also, the themes obtained have been presented with the tables in the section of findings of the present study. These tables included all the themes regarding the variables in the related study. However, the themes related to gamification within the scope of the present study were explained with the support of direct quotations. In this process, information about the participants was kept confidential. The direct quotations were given with reference to the source of the data. For example, the data source given as "P, Interview-2" was used to refer to the second interview for the control group.

Results

This part presents the findings obtained via the quantitative and qualitative research data. Since the convergent parallel mixed design was used in the study, the findings are presented below by relating the qualitative and the quantitative data.

Findings Regarding the State of Emotion

In order to determine the effectiveness of the gamification on emotion, the data regarding the participants' emotional states were examined. For this purpose, the means of participants' responses to the weekly rating activity were calculated, and their mean emotion scores were obtained. It was found that there was a little difference between the mean emotion scores of the experimental (n= 30; $\bar{x}$=3,48; SD= 0,52) and control (n=33; $\bar{x}$=3,43; SD= 0,59) groups. This difference was examined using independent samples t-test, and no significant difference was found between the emotion states of the groups ($t_{(1,61)}$= -.382; p=.704). In order to relate these findings with the qualitative data, the data obtained via the experience activity, interviews and focus group interview were used. According to the themes obtained via the experimental and control group participants' views about their positive emotions (Table 1), the participants in the control group felt happy, amused, self-confident and comfortable, while those in the control group felt amused, happy, comfortable, ambitious and curious. The participants in the experimental group reported that they felt amused, ambitious and curious due to gamification.

Table 1. The Opinions of Participants in the Experimental and Control Group on their Positive Emotional State

Groups	Themes	f	%
Experimental Group	Amused	47	34,06
	Ambitious	16	11,59
	Curious	12	8,70
	Happy	54	39,13
	Comfortable	9	6,52
	Total	138	100
Control Group	Amused	18	15,52
	Happy	100	86,21
	Self-Confident	11	9,48
	Comfortable	5	4,31
	Total	116	100

The participants in the experimental group reported that they felt entertained, ambitious and curious due to the gamification elements. It was seen that among the gamification elements, the award, competition, badge and level caused the participants to feel excited. Thanks to the face-to-face award activity, the participants felt themselves excited. In relation to this, one of the participants said *"It was entertaining for me. I tried my chance in the wheel of fortune. (E, Experience-4)"*. It was found that another factor making the environment entertaining was competition. It was revealed that competition caused by the experience point and level in online environment was influential on the participants' excitement. Regarding this, one of the participants said *"These activities and those opened every week were all our homework, and you entertain while doing your homework. When you use the system, you get one point from the homework you have done (E, Interview-3)"*. Besides all, the participants stated that they felt entertained thanks to the badges. During the interviews, one of the participants reported that the badges caused them to feel amused. When this participant was asked the reason why s/he felt amused, s/he said *"you get a point, a badge, and other different things (E, Interview-3)"*. The participants stated that there was an entertaining environment due to the level system. In relation to this, one of the participants said *"We started to try hard, and it was really entertaining just because we did those tasks and went through upper levels (E, Interview-3)"*.

The participants stated that the gamification elements of activity completion notification, progress bar, restrictions, awards, competition and badges were influential on their happiness. Regarding this, one of the participants said *"For example, if there is no tick, I learn that I didn't do that activity. If that box is empty, then I tend to do the activity. I mean if the box is ticked, you get happy because you know you have done that task or because you have achieved something. Think that you have done something; they appreciate your behavior, right? That tick in the box is just like that (E, Interview-3)"*. The influence of winning an award on the participants' happiness was explained as follows: *"When I completed the activities, I felt happy. I got different awards each time, and they were all beautiful (E, Experience-6)"*. It was seen that regarding the theme of positive emotion, competition occurred due to the experience point, leaderboard and level. In relation to this, one of the participants said *"I got happier as my points increased (E, Interview-3)"*. The participants also reported that they felt happy when they went one-level up in the level system. In relation to this, one of the participants said *"When I went up in the level system, I was happy (E, Interview-3)"*. One of the participants reported that s/he felt proud of himself/herself when s/he got a badge: *"It makes you feel as if you got a rank, and you feel proud of yourself. It makes you happy. (E, Interview-2)"*.

Different from those in the control group, the participants in the experimental group reported views about the themes of ambition and curiosity. It was found that the gamification elements of restriction, award, competition and badge caused the participants to feel ambitious. It was seen that due to the level-restrictions regarding the activities, the participants got ambitious to overcome this restriction. In addition, it was also seen that the participants got ambitious to win an award. Moreover, it was revealed that the leaderboard, which showed the positions of the participants based on the experience point, was influential on the participants' ambition. The participants reported that they got ambitious when they were behind other participants in the leaderboard or when their experience points were lower. In relation to this, one of the participants said *"I recognized that I was behind the others, and this made me ambitious (E, Experience-13)"*. Another gamification elements that caused the participants to become ambitious was the badge. Regarding this, one of the participants said *"It made me ambitious. Just to go up the levels, to get the badges, or to wind the wheel of fortune, I mean when everyone gets ambitious, you give more importance to it. (E, Focus group interview)"*.

It was seen that activity restrictions and the badges were influential on curiosity. Being curious due to the activity restriction was mentioned by one of the participants as follows: *"…for example, when you do not complete an activity, the others are not opened. Thus, you get curious about the other activities (E, Interview-1)"*. Another participant explained how s/he got curious due to the badges saying *"For example, suppose a friend of yours has a badge. When you see it, you think that you can also achieve it. Thus, you start doing it because it raises curiosity (E, Interview-1)"*.

Within the scope of the study, the participants in the experimental and control groups also stated that they had negative emotions. The participants in the control group felt bored, forced, strange and anxious, while those in the experimental group felt forced, bored, annoyed, uncomfortable and anxious. Table 2 presents the overall structure of these themes.

Table 2. The Opinions of the Participants in the Experimental and Control Groups on the Negative Emotional State

Groups	Themes	f	%
Experimental Group	Anxious	9	14,75
	Uncomfortable	25	40,98
	Bored	9	14,75
	Annoyed	2	3,28
	Forced	16	26,23
	Total	61	100
Control Group	Anxious	6	15,00
	Bored	19	47,50
	Strange	6	15,00
	Forced	9	22,50
	Total	40	100

The gamification elements also had negative effects of the participants' emotions in certain respects. The participants in the experimental group reported that due to the gamification elements, they developed several negative emotions like being challenged, bored, annoyed, uncomfortable and anxious. In relation to this, one of the participants said *"I felt good while carrying out the applications, but I found it difficult to pass Level-4 (E, Experience-10)".* In addition, within the scope of the study, it was found that activity restriction and experience point caused the participants to get bored, annoyed and uncomfortable. Regarding the element of activity restriction, one of the participants said *"…I felt obliged to complete it just to remove the restriction for the following week, and this made me tired of doing it (E, Experience-7)".*

The participants stated that they got bored due to sharing of irrelevant subjects in social forum. In relation to this, one of the participants said *"… Especially last night, I really got bored. Everyone was sharing something even if it doesn't make sense (E, Interview-1)".* In addition, t was seen that the leaderboard sometimes caused the participants to feel annoyed. Furthermore, it was found that the participants they felt sad when they took a place behind others in the leaderboard. Regarding this, one of the participants said *"you of course get unhappy when you see your place at the bottom in the leaderboard, but you work harder then (E, Interview-3)".* The participants reported that they failed to do the activities due to the activity restrictions and fell behind others in the leaderboard and that they thus got annoyed. In relation to this, one of the participants said *"I got annoyed just because my position in the leaderboard would worsen because my point would decrease as I would not be able to do the activity of the following week. But felt angry at myself just because I failed to do it (E, Interview-2)".*

The participants stated that the over-competitive environment made them uncomfortable. In relation to this, one of the participants said *"I don't feel comfortable with the points received from the forum. I mean you can get a point by sharing information in the news forum or in any other forum, but you already get a point every time you go online on the website. To me, this is unnecessary because I had friends who visited the website only to get a point. I mean it leads to nonsense competition. It doesn't worth doing so (E, Interview-3)".*

The participants also reported that they felt uncomfortable when they failed to reach the target level in the level system. One of the participants mentioned his/her discomfort saying *"I can't say I felt good when I completed all the levels (E, Experience-12)".* Regarding this, one of the participants said *"There was another problem. For example, I am now at level-11, and there is no further level. This is quite disturbing (E, Interview-3)".*

Findings Regarding Interest

In order to determine the effectiveness of the gamification, the qualitative data obtained via the experience activity, the interviews and the focus group interview regarding the participants' state of interest were examined. According to the experimental group participants' views, the gamification elements had an important role on the participants' interests. The situations that drew the participants' interests were gathered under the themes of *restriction, notifications, activity completion, progress, profile and competition*. The views of the control group participants about the interesting features in blended learning environment were gathered under the themes of face-to-face environment, activities, content, novelty effect, social interaction, interface design and benefits, while in the experimental group, the theme of gamification was obtained besides all these themes.

Table 3. The Opinions of Participants in the Experimental and Control Group on Their Interest

Groups	**Themes**	**f**	**%**
Experimental Group	Interface Design	11	3,50
	Activities	65	20,70
	Benefits	20	6,37
	Content	96	30,57
	Gamification	55	17,52
	Social Interaction	21	6,69
	Novelty Effect	30	9,55
	Face-To-Face Environment	16	5,10
	Total	314	100
Control Group	Interface Design	6	3,30
	Activities	38	20,88
	Benefits	9	4,95
	Content	84	46,15
	Social Interaction	13	7,14
	Novelty Effect	12	6,59
	Face-To-Face Environment	20	10,99
	Total	182	100

The participants stated that the level restriction in the online environment drew their interest. In relation to the influence of level restriction, one of the participants said, "*What was most interesting for me was the requirement of being at a certain level to do the activity (E, Experience-11)".* According to the participants, the e-mail notification for incomplete activities and the feedback regarding activity completion were interesting.

In the study, it was found that the progress bar was interesting, and that this element allowed monitoring one's own individual progress. In relation to this, one of the participants said *"Thanks to the progress bar, we can see the activities we completed or those we did not. When you see the activities you still did not complete, you recognize that you have neglected it a lot, and you reconsider your performance (E, Interivew-3)".*

In the study, it was also revealed that the profile page in online environment which included personal information about the participants, their avatars and the badges they won was found interesting by the participants. Regarding this, one of the participants said *"It is beautiful to have your own profile. For example, when someone who knows nothing about me at all can learn something about me when they look at my profile. I mean this is nice to me (E, Interview-1)".*

The competitive environment that occurred between the gamification and the participants was found to be another situation that drew the participants' interest. In relation to this, one of the participants said *"The things drawing my interest, when I compare with my friends, I mean it was good to compete with them. This makes you ambitious (E, Interview-2)"*. It was reported that this competitive environment was created via such gamification elements as experience point, leaderboard, awards, badges and levels. The participants stated that getting experience points in online environment drew their interest. This situation could be said to result from scoring all the behaviors of the participants in online environment. In relation to this, one of the participants said *"Without the system of getting points, the forum would not interest me. I mean, with this system of getting points, everything was interest for me (E, Interview-3)"*.

The participants reported that they were able to compare their experience points with those of other participants thanks to the leaderboard and that the competitive environment occurred accordingly. In addition, the participants stated that ranking the first in the leaderboard or being at higher levels in the leaderboard drew their interest as well. Also, the participants pointed out that winning awards was interesting in the online environment. In relation to this, one of the participants said *"It was very nice this week. This platform encourages people, and I was awarded thanks to this (E, Experience-3)"*. In the study, in order for the participants to win an award, a competitive environment occurred between them. It was found that this competitive environment drew the participants' interest. The badge, another gamification element creating the competitive environment, allowed the participants to compare themselves with others. Regarding this, one of the participants said *"… Sometimes, I looked at what kinds of badges my friends got and for what they got them, and I looked at the badges I didn't have. For example, I didn't do some of the homework assigned, and when I recognized that they got these badges for these assignments. I didn't get those badges because I hadn't done the related homework (E, Interview-3)"*. The participants stated that they monitored their own progress thanks to the badges which they received after completing certain activities. In addition, it was found that the badges were regarded as awards and rank. In relation to this, one of the participants said *"… we get badges in line with our works. This is very nice. I mean we get a kind of award (E, Görüşme-2)"*. Another gamification element that led to a competitive environment between the participants was the level system. The participants reported that they compared themselves with others thanks to this level system. Regarding this, one of the participants said *"… As it was possible to see the levels of our friends, there was a competitive environment. To me, without the level system, it would be nonsense (E, Interview-3)"*.

Findings Regarding Online Participation

In the study, the quantitative data were collected in relation to the time the participants spent in online environment, and the qualitative data were collected using the data collection tools of interviews and focus group interview. Moodle's plugins were used to keep records of the time spent by the experimental and control group students in online environment and transformed into the time unit of seconds. Table 4 presents the descriptive results regarding the mean time (seconds) spent by the groups in online environment.

Table 4. Descriptive and t-Test Results Regarding the Time Spent in Online Environment

	Groups	**n**	$\bar{x}$	**SD**	**t**	**p**	η^2
Online participation	C	33	570,24	465,83	-.5,03	.001	0,311
	E	30	2122,20	1630,52			

The mean time spent by the groups was examined using independent samples t-test, and a significant difference was found in favor of the experimental group ($t_{(1,61)}$= -.5,03, p<.05). Based on this finding, it could be stated that gamification increased the time spent by the participants in online environment. In order to relate these findings with the data collected via qualitative data sources, the qualitative data regarding online participation were used. The views of the experimental and control group participants were mostly related to the themes of activities, responsibility, social interaction,

benefits and novelty effect, while the experimental group participants reported that besides these themes, gamification was influential on their online participation. Table 5 presents the views of the experimental and control group participants about online participation.

Table 5. The Opinions of Participants in the Experiment and Control Group on Online Participation

Groups	Themes	f	%
Experimental Group	Activities	11	21,15
	Benefits	16	30,77
	Gamification	9	17,31
	Responsibility	3	5,77
	Social Interaction	10	19,23
	Novelty Effect	3	5,77
	Total	52	100
Control Group	Access	2	8
	Activities	4	16
	Benefits	10	40
	Responsibility	6	24
	Social Interaction	1	4
	Novelty Effect	2	8
	Total	25	100

The views of the participants in the experimental group revealed that badge, experience point and restriction were influential on online participation. The experimental group participants stated that they participated online to win awards via the badges. In relation to this, one of the participants said *"Those coins were really good. The other badges also encouraged my friends to use the system more (E, Interview-3)"*. The participants reported that getting experience points was one of basic reasons for online participation. Regarding this, one of the participants said *"It brings you points. Especially activities bring high points. I did the activities for this reason (E, Interview-3)"*. In addition, experience points were found to be influential on online participation with respect to winning awards, going one level up and creating a competitive environment. Thanks to the experience point, the participants' winning such awards as badges, exam grades and cinema ticket was influential on their online participation. In relation to this, one of the participants said *"The website (online environment) provides us with various opportunities. We get badges according to our works. This is quite beautiful. It is something like an award. As a result, we can win a cinema ticket or high grades in mid-term or end-of-term exams. It is a really good thing, and it makes students more active (E, Interview-1)"*.

In the study, it was found that competition between the participants had an important role in online participation. The competitive environment created by gamification encouraged the participants to get experience points in order to avoid remaining behind other participants in the leaderboard. It was seen that the leaderboard based on the experience point constituted the basis of this competition. In relation to this, one of the participants said *"… You keep being active there for a certain period of time, I mean you always try to be at the top in the leaderboard (E, Interview-1)"*. It was seen that competition was divided into two: individual competition and competition with other participants (within group). Individual competition refers to the view of "I should do better next time", which means competing with oneself. Regarding this, one of the participants said "*To me, the badges were something like… for example, you complete the whole game, or you play a game and want to see that you have finished the game one hundred percent. When we collect all those badges, you see that percentage, I mean you see that you completely finished it. This makes you happy. When I play such a game, I always want to see that I have finished the game (E, Interview-3)"*. Competing with the group involves participants' efforts to be over the other participants in the leaderboard thanks to their experience points and to take a place at the top in the leaderboard.

Within the scope of gamification, it was seen that the participants participated online to remove the activity restrictions and then to complete the following activities. In relation to this, one of the participants said *"It is homework, and if I don't do it, it will be closed. If I don't do it in a week, in the second week, it will close, and the other activity will not open, and another activity of the following week will not open, too (E, Interview-3)"*. In addition, it was found that the participants tried to get experience point to reach a certain level and to remove the restrictions of the activities of the following week. Therefore, the gamification elements could be said to be influential on the participants' online participations.

Discussion

The present study aimed to examine gamification elements with respect to emotion, interest and online participation. Therefore, in line with the findings obtained via the data collection tools, the influence of the gamification elements on individuals' emotion, on the interest, which motivates individuals, and which is regarded as an adaptable emotion (Izard, 2007; Sung et al., 2016), as well as on individuals' online participation, which is shaped in accordance with these variables indicating their online behaviors) was examined.

According to the quantitative findings obtained in the research, the results revealed no significant difference between the groups' emotion scores. According to the findings obtained via the qualitative data, the gamification elements allowed the participants to develop positive emotions on one hand and caused them to have negative emotions on the other. It was seen that the gamification elements of award, competition, badge and level were influential on feeling happy and amused. In relation to this finding, Marczewski (2015) claims that individuals release dopamine in their bodies and thus become happy when they are awarded. In addition, in studies reported in related literature (Freitas & Freitas, 2013; Lieberoth, 2015), it is pointed out parallel to the findings of the present study that gamification have an important role in creating an entertaining environment. However, it was seen in the study that the participants got bored, annoyed and uncomfortable and experienced difficulties when they failed to remove the activity restrictions and thus failed to get the necessary experience points to pass the levels. In other words, it was found that being in higher positions in the leaderboard caused the participants to feel happy and that the opposite situation led to discomfort. This finding is consistent with the one obtained by Alomar, Wanick and Wills (2016), who reported that the gamified environment allows participants to feel happy. It can also be said that the level of difficulty for the participants to pass to a higher level is not felt into the flow because of their perceived difficulty (Csikszentmihalyi & Rathunde, 2014). In addition, over-competition in gamified environment was found to develop the feeling of discomfort. The reason for this discomfort can be explained with the finding obtained by Song, Kim, Tenzek, and Lee (2013), who reported that individuals with a less competitive personal trait feel themselves worse in a competitive environment. Furthermore, in a study conducted by Gizir (2005), it was found that over-competition has negative effects on friendships of students as well. For this reason, based on the idea that over-competition negatively influences friendship relations, it could be stated that it caused the participants in the present study to develop negative emotions. It was seen that the participants compared themselves with the other participants in the gamified environment with the help of gamification elements. Considering the fact that as required by the nature of human, social comparison is a basic factor of social life (Festinger, 1954), the reason for this comparison in gamified environment can be explained. However, learning is in a transformation process in which individual features are more centralized. Although the competitive factors in gamification are regarded as external motivation factors regarding success, it could be stated that competition has negative influence on this transformation regarding individual learning.

The experimental group participants' views about their states of positive emotion were mostly about the concepts of ambition and curiosity. In the study, it was seen that the participants got ambitious thanks to the competitive environment created by awarding and experience point. This finding is consistent with the one obtained by Yıldırım and Demir (2016), who reported that competition makes participants ambitious. Therefore, it could be stated that the gamification elements caused the participants to get ambitious as these elements pave the way for the establishment of a competitive

environment. It was seen that the gamification elements of restriction and badges raised the participants' curiosity. This finding supports the one obtained by Seixas, Gomes, and de Melo Filho (2016), who reported that gamification make participants curious.

The effectiveness of the gamification elements in blended learning environment was also examined with respect to the findings obtained via the qualitative data. It was seen that the gamification elements of restriction, notifications, activity completion, progress, profile and competition were influential on the participants' interests. It was also found that the time-based and level-based restrictions for the activities were interesting. In addition, thanks to the progress bar, the participants were able to monitor their own progress and received notifications regarding their progress. This finding, which demonstrated that notification was interesting, is parallel to the views reported in related literature that the progress bar provides notifications for participants (Sailer, Hense, Mayr, & Mandl, 2017; Zichermann & Cunningham, 2011).

In the study, it was found that the competitive environment created thanks to the gamification elements of experience point, leaderboard, award, badge and level was interesting. This finding is supported by the one obtained by Nebel, Schneider, and Rey (2016), who revealed a relationship between competition and interest. In addition, as the face-to-face award activity allowed winning awards within and out of the online environments, it was regarded by the participants as award. This finding is consistent with the idea in literature that awards within and out of the system is used as a gamification element (Lewis, Swartz, & Lyons, 2016). Moreover, the badges were considered by the participants to be awards and rank. Consistent with this finding, in related literature, it is reported that badges are also regarded by participants as specialization (Gibson, OstasHewski, Flintoff, Grant, & Knight, 2015). Furthermore, this finding is similar to the one obtained by Clark et al. (2011), who reported that students compare themselves with others thanks to badges. It was seen in the present study that badges were interesting and influential on the establishment of the competitive environment. This finding is supported by the view put forward by Abramovich, Schunn, and Higashi (2013) that badges have positive influence on interest.

The effectiveness of gamification elements in blended learning environment was examined with respect to online participation based on the findings obtained via the qualitative data and the time spent by the participants in online environment. The participants in the experimental group stated that they participated online due to the gamification. This finding is consistent with the one obtained by Barata, Gama, Jorge, and Gonçalves (2015), who reported that gamification has positive influence on online participation. It was found in the present study that the gamification elements of badge, experience point, and restriction were influential on the participants' online participation.

The participants got various badges when they completed the activities. As the badges allowed participating in the face-to-face award activity, they encouraged online participation. The badges increased the participants' online participation by triggering their curiosity. This finding supports the one obtained by Robinson and Bellotti (2013), who reported that curiosity has positive influence on participants' engagement. In addition, the participants compared their badges with those of others, which helped create the competitive environment.

In the study, it was seen that the participants completed the activities to get experience points in online environment. Moreover, experience point was influential on online participation not only with respect to allowing the participants to win awards and to increase their levels but also with respect to the establishment of the competitive environment. It was seen that the participants participated online to get experience point as it allowed them to win awards. This finding is parallel to the one obtained in a study carried out by Denny (2013), who held the belief that badges are influential on online participation. In addition, the participants tended to get experience point to increase their levels and participated online. Therefore, it is thought that experience point has positive influence on online participation with respect to the award and level.

The competitive environment was perceived to be interesting thanks to the gamification elements, and this finding is consistent with the one obtained by Kuo and Chuang (2016), who reported that gamification elements are interesting. In the present study, it was seen that the level was influential on the establishment of the competitive environment. The participants compared their own levels with those of their opponents and made efforts to get experience point so that they could reach or pass the levels of their opponents. Consistent with this finding, Zichermann and Cunningham (2011) point out that one of the most important reasons why people play games is the desire to win the competition. Competition falls into two: individual and with a group. Individual competition refers to one's competition with himself or herself (Bowser et al., 2013), while competition with a group involves participants' competition with others thanks to the leaderboard and level. In addition, Song et al. (2013) claims that competition occurs not only due to the properties of a game but also due to individual characteristics. Therefore, the source of competition could be said to be individual characteristics and the properties of the gamified environment. In the present study, the participants created a competitive environment by comparing themselves with other participants thanks to the gamification elements. This finding is supported by the one obtained by Zichermann and Cunningham (2011), who revealed that individuals compare themselves with others thanks to gamification elements. As mentioned by Billieux et al. (2013), game-based activities have positive influence on participants' progress. For this reason, the factor of competition is thought to cause participants to spend more time in online environment. This situation is consistent with the finding of a study carried out by Song et al. (2013), who reported that competition encourages individuals to work harder.

In the study, the participants participated online to access the activities restricted based on the level and on the other activities. They also tried to remove the level restriction by getting experience point. In order to remove the activity restriction, they tried to complete the activities in the allocated time. Figure 2 presents the overall appearance of the gamification elements influential on the participants' online participation.

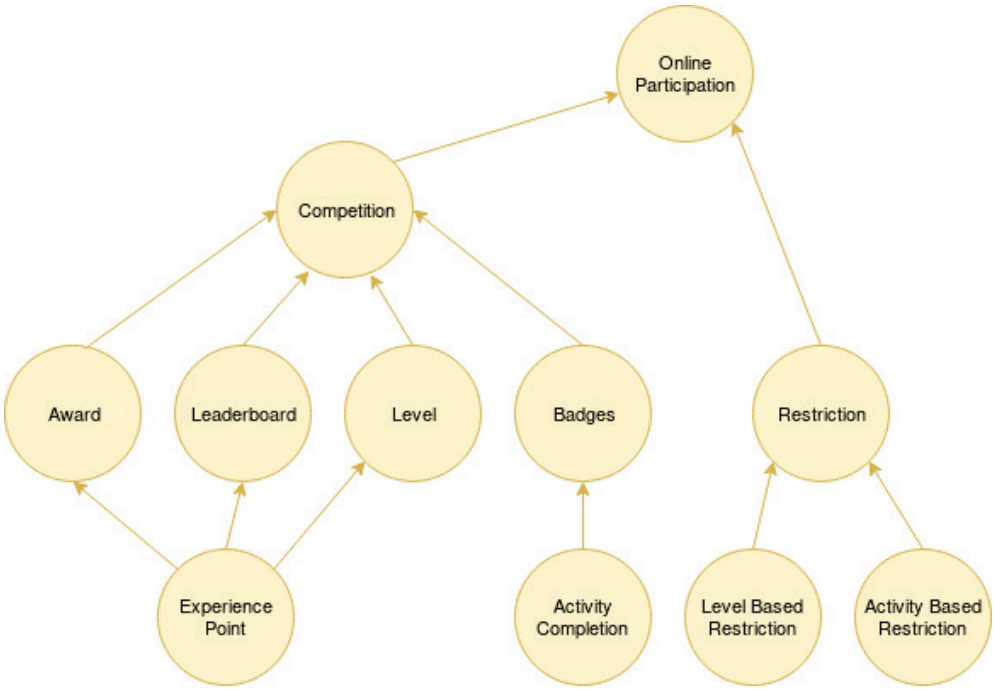

Figure 2. Gamification Elements Influential on the Experimental Group Participants' Online Participation

In the study, it was seen that the gamification elements illustrated in Figure 2 were influential on the participants' online participation. This finding is consistent with those obtained in other studies in related literature (Amriani, Aji, Utomo, & Junus 2013; de-Marcos, Domínguez, Saenz-de-Navarrete,

& Pagés, 2014; Hamari & Koivisto, 2015; O'Donovan, Gain, & Marais, 2013; Tenório, Bittencourt, Isotani, Pedro, & Ospina, 2016). Therefore, in the process of social comparison, the emotions felt by the participants due to the gamification elements caused them to be active in online environment. However, for the generalization of this finding, there is a need for more related research findings.

Limitations & Directions for Future Research

Although online environment, prepared for gamification using Moodle's plugins allows a number of gamification elements, the fact that gamification was limited to Moodle's plugins was another limitation of the present study. Considering the fact that gamification is context-specific, in future studies, gamification could be structured based on the research context. In order for gamification to be used effectively and productively in blended learning environments, overuse of the factor of competition may disturb individuals with low levels of competitiveness. Therefore, for the purpose of helping individuals failing to compete in gamified environments, they could be provided with new opportunities, or different types of gamification elements could be presented in the environment. Also, if individuals experience difficulty in acquiring the gamification elements, the difficulty levels of the gamification elements could be arranged in line with the individuals' competencies. On one hand, gamification elements help individuals develop positive emotions; on the other hand, these elements are also likely to cause these individuals to feel bored, annoyed, uncomfortable and anxious. In order to avoid such negative emotions in the learning process, gamification elements should be planned in a way to promote individuals' positive emotions.

Karataş (2014) classified gamification elements as badge, notification, point, experience, leaderboard, goal/task, award, the gamer's profile photo, achievement, respect, difficulty, imaginary, level, virtual rewards, progress bar and real award. Accordingly, although there are several gamification elements in related literature, the present study was limited to the gamification elements of giving instructions, progress bar, badge, level, experience point, leaderboard, award, restrictions of activities based on certain criteria (level, time, activity completion and so on), and presenting notifications to participants regarding the activities. Future studies could test the effectiveness of different gamification elements. In addition, within the scope of the present study, gamification was used in face-to-face and online environments. Lastly, future research could also focus on comparing use of gamification in face-to-face environment and its use in online environment.

Conclusions

In conclusion, the effectiveness of gamification elements in blended learning environments was to have both positive and negative effects with the state of emotion. However, use of gamification elements in blended learning environment was found to draw the participants' interest. In addition, it was revealed that the gamification elements created a competitive environment and had positive influence on online participation.

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Appendix 1. Weekly Distribution of Activities in Online Environment

Week	The Name of Activity
General Access Area	• Instant messaging • Social forum • News forum • Frequently Asked Questions (FAQ)
Week 1- Meeting and preparation	• Introduce yourself • Experience-1 • Rating-1
Week 2- Introduction to Information Technologies	• History of computer • Describe the fact that knowledge is not independent from knowing. • The future of information society and education • Changing technologies from the past to the present • Experience-2 • Rating-2
Week 3- Hardware	• Computer hardware • Current hardware news • Hardware form • Selecting the appropriate hardware tools • Experience-3 • Rating-3
Week 4 - Software	• Presentation of the week • Installation guide of Microsoft Windows 8 OS • Internet crime law • Ethics and information ethics • Software Piracy • Experience-4 • Rating-4
Week 5- Online Activity	• Computers without user • Information crimes • The reason for the use of technological tools • Software and hardware in the training environment • Repeat Test • Experience-5 • Rating-5
Week 6- Alternative Operating Systems	• Ubuntu Installation • Operating system installation with VirtualBox • Innovation about operating systems • Comparison of operating systems • Hybrid operating system • Experience-6 • Rating-6

Week	The Name of Activity
Week 7 - Internet Applications in Education	• Personal Blog Page • News sharing • Social networking risks • Web 2.0 technologies • Experience-7 • Rating-7
Week 8- Word processing programs	• Word processor activity • Word processor activity -2 • Word processor problems • Microsoft Office shortcuts • Microsoft Office icons • Experience-8 • Rating-8
Week 9- Alternative Word Processing Programs	• Alternative Office Programs • Formulas • Mail merge • Experience-9 • Rating-9
Week 10- Spreadsheet	• Spreadsheet activity • Student notation calculation • Account table problems • Experience-10 • Rating-10
Week 11- Spreadsheet - 2	• Course Application • Features that you like the account chart • Microsoft Office Excel additional source • Graphic activity • What can be done with Spreadsheet? • Experience-11 • Rating-11
Week 12- Presentation Preparation Programs	• Course Application • Biography of your favorite artist • Information technology and software lesson • Experience-12 • Rating-12
Week 13 - Web Based Preparation Presentation	• Digital Story • Technology Consulting • Experience-13 • Rating-13