

Pre-service Teachers' Perceptions on Game Based Learning Scenarios in Primary Reading and Writing Instruction Courses

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Abstract

The aim of this study was to explore pre-service teachers' perceptions on the use of game-based learning in a Primary Reading and Writing Instruction Course. A mixed method research was used in the study. Participants were composed of a total of 189 pre-service teachers taking the Primary Reading and Writing Instruction course during the fall term of the 2013-2014 academic year. After a 12-week teaching period, the data regarding pre-service teachers' views were collected by means of a questionnaire and semi-structured interviews. While the descriptive analysis technique, including the presentation of data in terms of frequency (f) and percentages (%), was used for the quantitative data, the qualitative data analysis was completed progressively over three phases: (1) data reduction, (2) data display, and (3) conclusion drawing. The results of both the qualitative and quantitative data revealed that pre-service teachers held positive opinions toward the use of game based learning scenarios in Primary Reading and Writing Instruction courses. Moreover, according to the results, the pre-service teachers stated that their knowledge related to primary reading and writing instruction was enhanced as a result of the game based activities. On the other hand, the challenge most frequently experienced by the pre-service teachers included feeling anxious about the possibility of failing to design both an age- and content-appropriate game.

Keywords: Game based learning • Primary reading and writing instruction • Teacher training • Primary school education • Pre-service teachers

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Societies need members able to research, find, and develop solutions to the problems that face them. Scholars in the field of education continue to ask how individuals may learn such skills. One way is game based learning (GBL) instruction by which educators try to provide GBL environments to support students' active engagement and motivation levels during instruction (Tham & Tham, 2012). According to Adler (1997) and Stanley (2009), learning through games is one of the most effective ways to learn because games are used to improve content mastery, higher-order thinking skills, and social skills during the learning process (Jan, 2013; Thomas & Brown, 2011). In addition, games are closely linked to the development of cognitive skills, memory and thinking skills, and language and literacy skills (Bodrova & Leong, 2005). Individuals learn language through a very entertaining game with their mothers. Children not only improve their ability to express themselves and realize their own talents, but also find themselves with the opportunity to improve their language, mental, social, emotional, and motor skills through games (Egemen, Yılmaz, & Akil, 2004). GBL also helps children learn basic scientific concepts (Şahin, 2001) and gives birth to new discoveries, providing immersive, authentic, and fun learning opportunities (Garris, Ahlers, & Driskell, 2002; Laghos, 2010; Nerantzi & Despard, 2012).

Pre-knowledge may be reinforced by the use of original educational games that also boost enthusiasm (Odenweller, Hsu, & DiCarlo, 1998). Brooker (2000) and Pivec, Tarin, & Koskinen (2011) have also stated that games are useful tools in structuring knowledge. Similarly, Pivec, & Kearney (2007) point out that games provide opportunities for learners to put what they have learned into practice. Just as games may be used to expand the horizons of children's minds and enable them to explore new universes, so too may they be used to expose them to new ways of learning, teaching, and using creative and dynamic perspectives within such new universes (Lacasa, Méndez, & Martínez, 2008). Games also provide a risk-free environment for participants' new ideas to flourish, change their opinions, and explore new outcomes. As people of various backgrounds and experiences play such games, they contribute ever more to the learning process, sharing in a practical way their individual perspectives and experiences to the rest of the class. GBL has generally been used in college classrooms not only to develop and/or illustrate an idea or concept to learners in order to check their understanding or allow for transfer-of-learning, but

also as a way to keep students engaged in learning activities (Anderson, Anderson, & Tylor, 2009).

Games provide teachers new options to educate their students. Just as educational games help children improve their strategic thinking, planning, communication, and decision-making skills (Kirriemuir & McFarlane, 2004; Pratt, Winters, Cerulli, & Leemkuil, 2009), so do they enhance creativity in children, make them more active, and contribute to the development of their decision-making skills (Spiegel et al., 2008; Squire, 2006). Games also introduce children to new words, helping them to internalize these new concepts so as to be able to use them in their daily lives without experiencing difficulties (Divjak & Tomic, 2011). In addition, games help facilitate such skills as identifying problems and developing solutions (Altunay, 2004; Brooker, 2000; Dağbaşı, 2007). While playing games, children find themselves facing a variety of situations that contribute to the development of their problem-solving skills and creativity (Eow, Wan Zah, Rosnaini, & Roselan, 2009). Zelinová (1999) states that games have a vital role in children's development with respect to building self-confidence, increasing creativity, enhancing the development of sensory and motor skills, retention, evaluation, and creative thinking (as cited in Vankuš, 2005). Games are a source of motivation for learning and completing activities (Brooker, 2000; Divjak & Tomic, 2011; Gee, 2009; Jan, 2013; Pivec & Kearney, 2007; Pivec et al., 2011; Thomas & Brown, 2011). Games provide opportunities for self-learning, ongoing interaction, and feedback, which can, in turn, arouse further interest and motivation (Cheng & Su, 2012). Furthermore, when games are used in classrooms, learners' self-efficacy levels increase, helping them not only to increase their pattern recognition and response skills, but also to develop positive attitudes toward learning (Squire, 2006). Research has shown that in order to promote positive attitudes toward learning and memory skills, games should be considered as effective teaching tools as opposed to traditional methods (Kolb & Lewis, 1986). Frossard, Barajas, & Trifonova (2012) state that GBL encourages creative teaching practices and makes the learning process more effective (Vos, Meijden, & Denessen, 2011). The literature mentioned above shows that GBL is an effective alternative for teachers desiring to make their instruction more attractive and productive.

Games can be used across disciplines, age groups, and educational levels (Clarke, 2012). Nowadays,

GBL has caught the attention of educators at all levels (Frossard, Barajas, Alcaraz-Domínguez, Trifonova, & Quintana, 2011) with GBL environments being used very successfully in formal education (Liao, 2011). The studies in the literature illustrate that games are frequently used in education (Anderson et al., 2009; Bakar, Tüzün, & Çağiltay, 2008; Becker & Jacobsen, 2005; Cheng & Su, 2012; Cherney & London, 2006; Dumitrache, Logofatu, & Almasan, 2011; Dwyer, 2007; Emin-Martinez & Ney, 2013; Frossard et al., 2011; Holmes, 2011).

Due to the fact that children find them entertaining, games are considered as effective tools to be used in primary education to attract learners' attention to the course and, at the same time, facilitate their learning (Şahin, Demir, & Önen, 2012). Cejpeková (1996) states that games have positive effects on the development of primary education learners' levels of active engagement, retention, imagination, concentration, thinking and speaking skills, ability to learn by living, building self-confidence, realizing social learning, developing interests, meeting their individual needs, and enhancing creativity (as cited in Vankúš, 2005).

Primary Reading and Writing Instruction and Games

GBL is generally effective in primary education because primary school learners are at an age when games are particularly effective. During this period, they also experience difficulty learning abstract concepts and procedures (Çelenk, 2005), requiring both entertaining methods and to be actively involved in Primary Reading and Writing Instruction (PRWI) activities. With this being the reality, PRW instruction allows for children to transition smoothly into their future education careers. In this sense, PRWI focuses not only on teaching students reading and writing skills, but also on maintaining an environment in which students also learn about the basic knowledge, skills, attitudes and habits that will benefit them throughout their entire life. For this reason, PRWI is of critical importance in students' lives. Akyol (2011) stated that PRWI aims to aid students in learning basic skills in Turkish, such as how to use Turkish accurately and effectively, how to maintain communication, how to solve problems, and make decisions. Because PRW is abstract by its nature, it might be difficult for primary school students to learn. Making things concrete in teaching writing and reading within PRWI might help this difficulty to be overcome. According to Saygılı (2013), games

would render the reading and writing process more fruitful for both teachers and students. Using games in teaching primary reading and writing might contribute to an environment that not only increases learners' motivation levels, but is also effective in lowering anxiety levels (Özenç, 2011).

In the same line, Ara (2009) also points to the fact that games not only provide a wonderful atmosphere in children's language class, but also facilitate meaningful learning, make learning enjoyable, avoid dull repetition, and motivate learners. In addition, Sorensen & Meyer (2007) state that languages have often had to be learned and used by children in order to engage and participate in games. Therefore, game-based activities should be designed for first graders to make them mentally active, help them structure knowledge, meet their movement needs, provide them with opportunities to share ideas with peers, and construct an entertaining learning atmosphere.

The effective integration of GBL effects the success of the PRWI process. In order to successfully integrate GBL into their classroom activities, teachers need to know how to design games which are not only appropriate to their students' level, age, and developmental stage, but which are in line with the learning outcomes of PRWI. In addition, they also need to know how to integrate these games into the teaching process. Therefore, the effective development and use of educational games in PRWI depends heavily on the knowledge, experience, and attitude of teachers. It is therefore crucial for teachers to make use of their students' creativity, knowledge, skills, and competence while designing these games. As a result, it is of utmost importance for pre-service teachers to be trained in integrating educational games into primary reading and writing education.

Using GBL in Teacher Education in a PRWI Course

Teacher education is essential in shaping a teacher candidate's professional development through opportunities and contexts that will help them knowledge acquisition, improve their critical thinking skills, and reflect on their teaching practices and classroom environment (Al-Issa, 2011). According to Popescu et al. (2011), it is expected that good teachers be able to integrate games effectively so as to provide meaningful learning experiences in their classrooms. Similarly, Popescu et al. stated that teachers should use

games that have already been practiced and whose effectiveness is proved so that they may have a good understanding of the games and be able to integrate them into the overall educational framework. The integration and effective use of educational games into the education process relies on the training and skills that teachers have procured before starting their career. For that reason, teacher educators should focus on GBL activities so that pre-service teachers might be aware of GBL and its use as a teaching method.

With the help of GBL, teachers are able to establish a class atmosphere conducive for doing collaborative work, participating in class activities, and solving problems, which will in turn help them improve their teaching methods (Dumitrache et al., 2011). The purpose of improving 21st century skills paves the way to use GBL in schools, which brings the following question to the forefront: How do we design and implement effective games in the classroom? (Jan, 2013). In addition to this, although GBL has been positively received recently, teachers seem to be reluctant to integrate GBL into their own teaching (ProActive, 2010). While it is essential for teachers to familiarize themselves which game-based teaching may be integrated into their teaching strategies (Anderson et al., 2009), Meletiou-Mavrotheris & Mavrotheris (2012) point out the fact that teachers are not fully aware as to how to integrate educational games into their teaching.

The studies in the literature prove that games are frequently used in education (Anderson et al., 2009; Bakar et al., 2008; Becker & Jacobsen, 2005; Cheng & Su, 2012; Cherney & London, 2006; Dumitrache et al., 2011; Dwyer, 2007; Emin-Martinez & Ney, 2013; Frossard et al., 2011; Holmes, 2011; Meletiou-Mavrotheris & Mavrotheris, 2012; Pivec & Kearney, 2007; Proctor & Marks, 2013; Rossiou & Papadakis, 2007; Tham & Tham, 2012; Yien, Hung, Hwang, & Lin, 2011). The literature review of the studies regarding education games shows that the available studies are mostly focus on the application and use of technology-supported games (Varışoğlu, Şeref, Gedik, & Yılmaz, 2013). Various studies also support the fact that using games leads to positive outcomes in teaching (Bayırtepe & Tüzün, 2007; Jonker & van Galen, 2004; Klara, 2011; Meletiou-Mavrotheris & Mavrotheris, 2012; Pulos & Sneider, 1994; Randel, Morris, Wetzel, & Whitehill, 1992; Steffe & Wiegel, 1994; Vankúš, 2008). Studies on game-based teaching have been done regarding its effect on teaching math (Altunay, 2004; Kılıç, 2007; Tural, 2005; Yiğit, 2007), computer skills (Bayırtepe & Tüzün, 2007; Ketelhut

& Schifter, 2011; Yağız, 2007), child development during the pre-school period (Aytekin, 2011), and on teaching Physics (Anderson & Barnett, 2011). There are also studies related to teachers' attitudes and perceptions toward games and game-based teaching (Bakar, Inal, & Cagiltay, 2006; Barbour & Evans, 2009; Kenny & McDaniel, 2011; Kennedy-Clark, 2011; Ketelhut & Schifter, 2011). However, these studies are neither directly related to using GBL scenarios in PRWI nor do they investigate teachers' perceptions regarding the use of such scenarios. Therefore, this study may contribute to the field by helping to fill this gap within the literature.

Significance of the Study

According to Al-Issa (2011), since each teacher holds different beliefs about the classroom and classroom management, the idea of using games may not be compatible with a certain teacher's beliefs. Topçu, Küçük, & Gökteş (2014) state that there exists a need to explore to what extent student teachers are aware of educational games, pointing out that little research has been carried out on this in Turkey. In the literature, it is worth pointing out the lack of research on PRWI despite the research conducted on educational games in math (Uğurel, 2003), science (Atalay, Coştur & Arslan, 2013), English language teacher (Al-Issa, 2011), and primary teacher education (Topçu et al., 2014; Duban, Kurtdeğid Fidan, & Selanik Ay, 2013). According to Saygılı (2013), studies in the literature reveal that teachers, due to their lack of knowledge on this subject, need to receive training and have access to resources in order to increase their awareness of GBL. Furthermore, in the literature the readiness of primary school teachers to design games and integrate them into their teaching has not been previously explored. The importance of this lack of research is understood when it is remembered that primary school teachers are the ones who manage the educational process while taking into consideration their students' developmental characteristics, individual differences, interests, and needs when they are still at such an early age. It thus becomes essential to provide opportunities to pre-service teachers within Schools of Education encouraging future teachers to implement GBL activities into PRWI courses. In order for such a reality to be realized, pre-service teachers should obtain proficiency in game-based teaching practices and then trained in how to integrate these practices into their classroom teaching.

Just as pre-service teachers need to learn the underlying pedagogy of using games during their teacher training programs, so do they need to gain experience in putting their pedagogical knowledge into practice if they are to successfully implement GBL activities into primary school PRWI courses. In the literature, there are numerous studies about GBL implementations; however, there are no studies about training pre-service teachers in both the theory and practice of how to use GBL activities in their instructions. Nor have any studies been conducted examining their views on or their experience using GBL in a PRWI course. The design and implementation of various games in PRWI courses are expected to have positive effects on pre-service teachers' professional develop. Among the more significant effects expected are (1) an increase in pre-service teachers' competence levels in using GBL scenarios in PRWI courses and (2) pre-service teachers' developing positive attitudes toward using GBL in PRWI. This study will further contribute to the literature because it sheds light onto pre-service teachers' views regarding games, detailing their feedback about using GBL in PRWI. Additionally, the pre-service teachers' opinions cited in this study might be helpful in developing curriculum for primary school teacher education programs as well as promote the exploration of the potential use of GBL in PRWI courses.

Purpose of the Study

The main aim of this study is to explore pre-service teachers' perceptions regarding GBL scenarios that they have developed in a PRWI course. In parallel with this aim, other sub-goals are as follows:

- What are the pre-service teachers' perceptions on conducting the PRWI course based on GBL scenarios?
- What are the pre-service teachers' perceptions on using GBL scenarios in PRWI in a primary school setting?
- What are the pre-service teachers' perceptions on how teaching practices based on GBL scenarios contribute to students' learning and the overall classroom atmosphere?
- What are the pre-service teachers' perceptions on the challenges experienced in designing, writing, and applying GBL scenarios?

Method

In this study, the mixed method research was employed. According to Creswell & Plano Clark (2007), the mixed method research focuses on collecting, analyzing and mixing both quantitative and qualitative data in a single study. Creswell (2008) states that the basic assumption behind the mixed method research is that using a combination of quantitative and qualitative methods helps to better understand the research problem and questions. The mixed method is adopted to explore, analyze, develop, and implement the same subject(s) from different angles (Fırat, Kabakçı Yurdakul, & Ersoy, 2014). In paralld mixed design research, the aim is to collect both quantitative and qualitative data synchronously, combining such data and using the results of which to explore a research problem (Creswell, Plano Clark, 2011). Thus, the quantitative data of the study was collected through a questionnaire developed by the researcher aiming to describe the perceptions of pre-service teachers toward GBL scenarios and the use of these scenarios in teaching reading and writing instruction. As for the qualitative data, the research data were collected via semi structured interviews aiming to explore their perceptions more deeply.

Participants

The participants of the study consist of 189 pre-service teachers in their third year of study in Adıyaman University's Primary School Teacher Education Department. Of the total, 97 pre-service teachers attended the daytime education program whereas the other 92 attended the evening education program during the fall term of the 2013-2014 academic year. The convenience sampling method was used. The participants included 102 (54%) male and 87 (46%) female pre-service teachers whose average age was approximately 20. Since teachers are the very foundation of the educational system, importance should be given to teacher education programs so as to equip them with the necessary teaching skills. It is for this reason that the target audience selected for this study was pre-service teachers.

Instruments

The quantitative data were collected through a questionnaire consisting of three parts. The first part contained demographic questions. The second part was a 37-item 5-point Likert scale which aimed at exploring the use of GBL scenarios in PRWI and

their effect on the attitudes of pre-service teachers toward the course as well as their perceptions of the general outcomes of these practices. The last part of the questionnaire consisted of two open-ended questions which aimed at ascertaining which issues the pre-service teachers considered important in preparing GBL scenarios and the problems that they encountered during the process. In order to develop the questionnaire, after doing a thorough literature review, an item pool was formed. To ensure the content validity of the questionnaire, expert opinions were requested. Two researchers who had previously carried out studies on reading and writing instruction, two researchers from the educational sciences, and one assistant professor from statistics were referred for their expert opinion. Upon finalizing the questionnaire, two pre-service teachers examined it to ensure content validity. After the expert opinions and pilot study, a 37-item questionnaire was developed on a 5-point Likert scale, whose options were "Totally Agree (5), "Agree (4)," "Undecided (3)," "Disagree (2)," and "Totally Disagree (1)." As for the reliability of the questionnaire, the Cronbach Alpha coefficients of reliability for each sub-dimension are as follows: .75 for "the perceptions of student teachers on the use of GBL scenarios in the PRWI course;" .79 for "the perceptions of student teachers on the use of GBL scenarios in PRWI in primary education," and .72 for "the perceptions of student teachers on the outcomes of the PRWI course in which GBL scenarios are used." As for the whole questionnaire, the Cronbach Alpha is .87. These scores reveal that the questionnaire used in the study is reliable.

To extend the quantitative results with qualitative data, interviews with 21 volunteer pre-service teachers were conducted to explore their perceptions on using GBL in PRWI. The semi-structured interview form included five questions. An expert with 17 years of experience in the Educational Sciences contributed to the preparation of the semi-structured interview form and to the determination of the study's phases. The expert has conducted studies regarding quantitative/qualitative research methods, planning technology-aided learning, and pre-service teachers' technology competencies. The questions were checked in terms of clarity, intelligibility, and content validity. The necessary changes to the questions were made based on the feedback. The questions were later piloted with two pre-service teachers to ascertain whether they were intelligible or not. The interviews were tape recorded and the tapes were later uploaded as electronic audio files suitable for computers.

Procedure

According to Van Eck (2006), three different approaches are primarily stated regarding the use of games in formal educational settings in the literature: (a) The first is about using commercial games as learning tools in the classroom; (b) The second is about integrating serious games as well as games for learning and multi-user virtual environments in the learning process; and (c) The last one is about designing games in cooperation with students who actually learn in the designing process (as cited Bourgonjon et al., 2013). The main focus of this study is the practice of designing game based learning scenarios together with the pre-service teachers in which the practice of designing games serves as a learning process itself.

The GBL process in the PRWI course covered 12 weeks. The three phases in this process were as follows: (i) The process of the GBL design, (ii) The GBL scenario creation process, and (iii) The game-based primary reading and writing teaching and learning processes.

The GBL Design Process: In the first phase, an overall plan was made and the pre-service teachers were informed about what they would do during the GBL design process. The pre-service teachers were asked to examine the Ministry of Education's curriculum and then select a letter of the alphabet for which they would design a GBL scenario. The design process continued for two weeks and each pre-service teacher was informed in detail about how to use GBL scenarios in teaching the letter they chose.

The GBL Scenario Construction Process: The pre-service teachers designed an in-class game to teach the letter of their choice along with a lesson plan to use this game. The scenarios that the pre-service teachers prepared included information about the goals and objectives, the student profile, assessment, and timing. In a nutshell, the pre-service teachers prepared GBL scenarios to develop sound and letter recognition and to make syllables and words with letters in line with the PRWI curriculum.

The Game-based Primary Reading and Writing Teaching and Learning Processes: The scenarios prepared by pre-service teachers were integrated into the learning and teaching process in the PRWI course. They used these GBL scenarios in focus groups that they had formed by using micro teaching techniques. After their application, the GBL scenarios were evaluated. After the evaluation, some of the pre-service teachers were asked to revise the scenarios or to prepare completely new

scenarios because it was found that their scenarios were not appropriate for first graders in primary school. Furthermore, some of them were not concrete enough or did not include clear goals and/or objectives. The tools used in some of the scenarios were also not appropriate for this group of students' level of development.

At the end of the application process, the pre-service teachers were given a questionnaire to explore their perception of GBL scenarios and the use of them in PRWL. This was followed by semi-structured interviews with 21 volunteer pre-service teachers.

Data Analysis

In analyzing the quantitative data, frequency and percentage were computed by means of a statistical analysis program. The distribution of participants' responses to the questions in the questionnaire was presented using percentages and frequencies. For the analysis of the qualitative data, the qualitative descriptive analysis technique was used. The analysis of the data was completed progressively in three phases: (1) data reduction, (2) data display, and (3) conclusion drawing (Miles & Huberman, 1994). In this process, the data were first described in a logical and meaningful way with participants' responses to the interview questions being recorded and later transcribed in a word processing program word by word. Then, the cause-and-effect relationships were scrutinized and a number of conclusions being drawn accordingly. In order to reflect participants' views in a striking way, the researcher often make use of direct quotations from the interviews. (The translation of the extracts taken from the interviews was made by an English language instructor working in a state university in Turkey). The primary school pre-service teachers participating in the interviews were given codes and numbers. Student teachers were coded as A_F, A_M; A: A combination of the participant's first initial and gender, F: Female and M: Male.

Trustworthiness

In this study, the following strategies were applied to increase the trustworthiness of the study:

- Each step of the data collection process and the analysis methods used were explained in detailed.
- The research was recorded from the beginning to the end.

- While analyzing and discussing the data, objectivity was upheld as much as possible.
- In analyzing and interpreting the data, the researcher attempted to remain objective by directly quoting participants' responses in the interpretation process.
- Different data collection methods were applied during the study.
- Colleagues' thoughts were taken to verify data results.

Research Ethics Procedures: Participation in the study was stated to be on a voluntary basis. The participants were also told that their real names were not to be used under any circumstances and were given nicknames. This assured the participants that their responses would remain confidential and that the study was reliable. After all the participants agreed to be recorded and volunteered to take part in the study, they were asked to read and then sign the consent form of the study.

Findings

The findings are presented in a combination of the qualitative and quantitative data. In the first place, the quantitative data collected via questionnaires and in the second place the qualitative data collected via semi-structured interviews are presented.

Table 1 illustrates the frequency and percentages of pre-service teachers' perceptions regarding the use of GBL scenarios in a primary school level reading and writing course.

According to Table 1, 52.4% of the pre-service teachers stated complete agreement with the item, "GBL scenarios contributed to my learning how primary reading and writing teaching should be achieved" and 46.0% with the item, "GBL scenarios provided a means for fun in this course." Likewise, 46.0% also stated complete agreement with the item, "GBL scenarios contributed to an enrichment in the educational environment" and 43.4% with the item, "GBL scenarios helped us to actively participate in the course." In addition to this, the majority of participants chose the "I agree" option for the following items: "I like it when primary reading and writing courses are supported with games." (61.4%); "GBL scenarios contributed to the improvement of my primary reading and writing instruction skills." (54.0%); "GBL scenarios helped structure the knowledge more easily." (52.9%); and "GBL scenarios helped reinforce the knowledge gained in the course." (58.2%). These items are those

Table 1
Pre-service Teachers' Perceptions on the use of GBL Scenarios in a Primary Reading and Writing Course in Primary Schools

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
GBL scenarios contributed to my learning how primary reading and writing teaching should be achieved	<i>f</i> %	99 52.4	87 46.0	3 1.6	--	--
GBL scenarios contributed to the improvement of my primary reading and writing instruction skills	<i>f</i> %	78 41.3	102 54.0	7 3.7	2 1.1	--
GBL scenarios increased my self-confidence in teaching primary reading and writing.	<i>f</i> %	70 37.0	88 46.6	21 11.1	9 4.8	1 .5
GBL scenarios helped me to obtain a good degree of knowledge on primary reading and writing instruction	<i>f</i> %	66 34.9	97 51.3	20 10.6	4 2.1	2 1.1
I gained skills for teaching the alphabet, syllables, words, and sentences through a game-based teaching method.	<i>f</i> %	81 42.9	95 50.3	8 4.2	4 2.1	1 .5
GBL scenarios boosted my motivation for primary reading and writing instruction.	<i>f</i> %	68 36.0	99 52.4	20 10.6	1 .5	1 .5
GBL scenarios improved how much knowledge I retained from the course.	<i>f</i> %	82 43.4	89 47.1	15 7.9	2 1.1	1 .5
GBL scenarios provoked interest in the primary reading and writing instruction course's content.	<i>f</i> %	63 33.3	91 48.1	24 12.7	8 4.2	3 1.6
GBL scenarios increased my interest in this course.	<i>f</i> %	58 30.7	93 49.2	21 11.1	12 6.3	5 2.6
GBL scenarios provided a means for fun in this course.	<i>f</i> %	87 46.0	78 41.3	13 6.9	7 3.7	4 2.1
GBL scenarios contributed to an enrichment in the educational environment.	<i>f</i> %	87 46.0	85 45.0	14 7.4	2 1.1	1 .5
GBL scenarios helped decrease the anxiety level of the class.	<i>f</i> %	45 23.8	88 46.6	38 20.1	15 7.9	3 1.6
GBL scenarios helped reinforce the knowledge gained in the course.	<i>f</i> %	60 31.7	110 58.2	15 7.9	4 2.1	--
GBL scenarios contributed to a better comprehension of the course's subjects.	<i>f</i> %	76 40.2	96 50.8	15 7.9	2 1.1	--
GBL scenarios helped us to actively participate in the course.	<i>f</i> %	82 43.4	81 42.9	20 10.6	6 3.2	--
GBL scenarios helped structure the knowledge more easily.	<i>f</i> %	66 34.9	100 52.9	19 10.1	4 2.1	--
I think that game-based teaching should be applied in other courses as well.	<i>f</i> %	70 37.0	85 45.0	27 14.3	6 3.2	1 .5
I prefer that primary reading and writing courses be conducted with games.	<i>f</i> %	51 27.0	81 42.9	39 20.6	16 8.5	2 1.1
I like it when primary reading and writing courses are supported with games.	<i>f</i> %	70 37.0	116 61.4	3 1.6	--	--
I find game-based teaching practices boring.	<i>f</i> %	--	3 1.6	6 3.2	58 30.7	122 64.6

upon which the student teachers mostly agreed. Thus, it can be concluded that just as GBL scenarios improve primary reading and writing instruction skills, so do they provide fun classes, enrich the educational environment, encourage pre-service teachers' active participation, help structure the knowledge more easily, and contribute to the reinforcement of knowledge gained in the course. Moreover, the pre-service teachers expressed positive opinions about having game-based PRWI classes.

Semi-structured interviews with the student teachers regarding the use of GBL scenarios in the PRWI course revealed similar results. According to these results, using GBL scenarios in PRWI courses makes the classes more fun, the content

more clear, and the level of understanding higher. Furthermore, GBL scenarios also help turn theory into practice, encourages active participation, and eases the gain of knowledge and skills related to primary reading and writing instruction. Extracts from the pre-service teachers' opinions on the use of GBL scenarios in PRWI courses are as follows:

"We used to get bored in theoretical courses. However, GBL helped us understand the content of the course and reinforce our knowledge. Because it was fun, almost everybody in the class participated in the activities. It contributed a lot to me. I think I could make my students more active by using GBL. I learned how to teach the alphabet to our students. We found a game for each letter in the alphabet and each game was different." (A_F).

Table 2

Pre-service Teachers' Perceptions on the use of GBL Scenarios in a Primary Reading and Writing Instruction in Primary Schools

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I don't think GBL will contribute to the primary reading and writing instruction process.	<i>f</i> %	16 8.5	30 15.9	7 3.7	57 30.2	79 41.8
I think I can use GBL in any phase of the primary reading and writing instruction process.	<i>f</i> %	46 24.3	78 41.3	37 19.6	20 10.6	8 4.2
I think GBL is time consuming in primary reading and writing instruction.	<i>f</i> %	10 5.3	25 13.2	32 16.9	83 43.9	39 20.6
I think GBL will make it easier for primary school students to learn reading and writing during its instruction.	<i>f</i> %	93 49.2	87 46.0	8 4.2	1 .5	--
GBL practices should be increased in primary reading and writing instruction.	<i>f</i> %	66 34.9	88 46.6	29 15.3	5 2.6	1 .5
GBL is an effective method in terms of evaluating primary school students' skills.	<i>f</i> %	84 44.4	81 42.9	19 10.1	5 2.6	--
The amount of time for GBL in primary reading and writing should be increased.	<i>f</i> %	41 21.7	85 45.0	48 25.4	14 7.4	1 .5
I think GBL is not effective in primary reading and writing instruction.	<i>f</i> %	5 2.6	6 3.2	11 5.8	77 40.7	90 47.6
I think developing games in primary reading and writing instruction is hard.	<i>f</i> %	20 10.6	54 28.6	25 13.2	72 38.1	18 9.5

"We learned how to teach a letter [of the alphabet]. We had the opportunity to turn theory into practice. GBL actually raised our awareness." (A_M).

"When I become a teacher, I can use GBL to teach reading and writing, I feel ready to do that. I feel competent. The practices were very enjoyable. I participated in the activities. I didn't just listen, I applied them as well." (M_F).

"We developed games not only to ensure the participation of students in the class in an enjoyable way, but also to reinforce what they had learned. I saw many different game scenarios. I gained knowledge about how to make my teaching effective and how to teach letters, syllables, and words effectively." (A2_F).

As seen in the pre-service teachers' views, using GBL scenarios in the PRWI course resulted in active student participation and in their ability to better structure content-based knowledge. By taking these results into consideration, it might be stated that using GBL scenarios in the PRWI course will provide positive gains for pre-service teachers.

Table 2 illustrates the frequency and percentage of the pre-service teachers' perceptions regarding the use of GBL scenarios in primary reading and writing instruction.

As seen in Table 2, the majority of student teachers (49.2%) think that GBL will make learning easier for primary school students in PRWI and that GBL is an effective method in evaluating students' reading and writing skills (44.4%). In addition to this, student teachers also state that GBL practices

should be increased in primary reading and writing instruction (46.6%) and that GBL can be used in any phase of the primary reading and writing instruction process (41.3%).

The interviews with pre-service teachers revealed that they believed that using GBL would provide effective outcomes in primary reading and writing instruction. In the interviews, the pre-service teachers expressed the idea that using GBL in PRWI would provide such benefits as attracting students' attention to the task and evoking interest in its content, making learning fun, establishing an effective reading and writing instruction environment, providing feedback to the teacher, making the evaluation process easy, and ensuring retention of the knowledge learned. Some extracts from the student teachers' opinions regarding the use of GBL scenarios in PRWI courses are presented below:

"When I become a teacher, I will use GBL when my students are distracted or have lost their attention to the lesson." (A_M).

"Children at that age are fond of games. Instead of presenting the information directly, it would be more effective if we presented it in a fun way. In my opinion, a better and more effective PRWI environment could be achieved through the use of games." (M_F).

"GBL provides feedback to the teacher. It makes it easier for students to evaluate what they have learned. For instance, through games, we can easily check whether a student really recognizes the letters [in the alphabet] in forming syllables." (A2_F).

"When we use these games with our primary school students, we can also use them to evaluate whether a student has really learned a letter [in the alphabet] or not. I think we can learn in a short, clear, and better way by using games." (S_F).

"I learned that primary writing instruction was really something that could be taught through games. Because the kid is already coming from a game context. In order not to take him out of this context, using games to teach not only ensures permanent learning, but also eases his adaptation to the school environment." (S2_F).

The data collected from the semi-structured interviews after the game's implementation is also parallel to the quantitative results of the study. The results of the study reveal that pre-service teachers believe that GBL scenarios will make learning reading and writing process easier and that it will have positive effects on learning. Reading and writing are indeed the most important skills in obtaining vital information throughout life. However, the acquisition process of these skills is highly demanding and requires a lot of effort. The best way to make it enjoyable and meaningful for children is to present reading and writing as a part of a game.

As seen in Table 3, the majority of pre-service teachers expressed that writing and applying a GBL scenario in a primary reading and writing course improved their critical thinking (50.8%), creative thinking (47.1%), and evaluation (46.6%) skills. In addition to this, the pre-service teachers stated that GBL based practices decreased their anxiety levels toward PRWI (45.0%) and that they could use the games they prepared effectively in primary reading and writing instruction.

The semi-structured interviews with the pre-service teachers revealed that the designing and applying GBL scenarios made positive contributions to them as individuals and future teachers. These contributions include the acquisition of professional teaching knowledge and skills, the opportunity to experience different applications, the ability to put theory into practice, and developing a sense of responsibility. Improving creative thinking and imagination skills, raising awareness, and promoting motivation are also among these contributions. Some extracts from the pre-service teachers' opinions are presented below:

"Here we had classes with both micro teaching techniques and games. This helped us to gain professional teaching skills, and it was quite effective..." (Z_F).

"I gained self-confidence. At least I realized that I could do something. I think my critical thinking skills have improved. We really thought about and critiqued the different aspects of the games developed in the course." (E_F).

"I have realized my weak points. I asked myself which area I wasn't fully competent in whether it was in my professional teaching knowledge, skills, or techniques. I have realized in which area I need improvement. This was a great experience for me." (S2_F).

The analysis of the data collected from the semi-structured interviews also reveals that GBL scenarios are beneficial in that they not only help pre-service teachers to discover their hidden talents and to test their skills, but also to introduce them to a new approach in teaching. In this sense, one of the important views that has emerged from the study's

Table 3
Pre-service Teachers' Perceptions on the Contributions GBL Scenarios Made to Students' Skills Base and to Teaching Proficiencies

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
GBL contributed to the development of creative thinking skills.	<i>f</i> %	75 39.7	89 47.1	16 8.5	7 3.7	2 1.1
GBL contributed to the development of critical thinking skills.	<i>f</i> %	49 25.9	96 50.8	29 15.3	12 6.3	3 1.6
GBL contributed to the development of my problem solving skills.	<i>f</i> %	49 25.9	84 44.4	42 22.2	10 5.3	4 2.1
GBL offered an environment that encouraged cooperation with my friends.	<i>f</i> %	79 41.8	76 40.2	24 12.7	9 4.8	1 .5
With GBL, I had the opportunity to evaluate both myself and others.	<i>f</i> %	61 32.3	88 46.6	33 17.5	6 3.2	1 .5
In my teaching life, I can prepare GBL scenarios to teach letters, syllables, words, and sentences.	<i>f</i> %	74 39.2	87 46.0	23 12.2	4 2.1	1 .5
GBL decreased my anxiety level toward primary reading and writing instruction.	<i>f</i> %	66 34.9	85 45.0	24 12.7	7 3.7	7 3.7
I believe that I can use the game I prepared effectively in my teaching life.	<i>f</i> %	102 54.0	67 35.4	13 6.9	4 2.1	3 1.6

results is that just as pre-service teachers should be provided the theoretical knowledge, so should they be provided with game-based reading and writing practices before they start their teaching career due to their contributions on professional development.

Table 4
Pre-service Teachers' Perceptions on the Challenges Experienced while Designing, Writing, and Implementing GBL Scenarios

Challenges	Stages	Themes	f	%
The Process of the GBL Scenario Design	The Process of the GBL Scenario Design	Anxiety about failing to design an authentic scenario	54	15.3
		Anxiety about failing to design an appropriate game for the students' age group	26	7.3
		Failing to design an interesting game	4	1.1
		Lack of time	32	9.0
		Anxiety about failing to design appropriate games that appeal to multiple intelligences	8	2.3
	The GBL Scenario Constructed	Time consuming	52	14.8
		Designing games that are inappropriate to the goals and objectives of the course	4	1.1
		The tiredness of re-designing a game after receiving feedback	11	3.1
		Fear of failure	27	7.7
		Nervousness	62	17.7
The Game-Based Primary Reading and Writing Teaching and Learning Processes	The Game-Based Primary Reading and Writing Teaching and Learning Processes	Anxiety about failing to keep the class's interest during implementation	17	4.9
		Anxiety aroused from the micro teaching application	6	1.8
		Uneasiness in front of the camera	8	2.3
		Failure in integrating GBL scenarios and primary reading and writing instruction into micro teaching	12	3.4
		Lack of time	29	8.2

As seen in Table 4, the pre-service teachers experienced various challenges in the design, development, and use of GBL scenarios in a primary reading and writing course. The most common challenges experienced by the pre-service teachers included being anxious about failing to design an authentic game, its being time consuming, and the lack of time to prepare them. In development of GBL games, being anxious about failing was as the most common problem expressed. The most common challenge stated in regards to the game's implementation into PRWI was the anxiety that they felt before their presentation, the lack of time,

and feeling anxious about failing to keep the class's interest during their actual presentation. Some of the challenges experienced by pre-service teachers in designing, writing, and using GBL scenarios are presented below:

"I was really nervous. I didn't know how to write and teach, so I was nervous. But since I studied it for the entire term, so I feel relaxed now. I feel that I can teach primary school students comfortably from now on." (E_F).

"I had difficulty in designing authentic, original games, which I had to do without taking inspiration from other games." (A_M).

"I had problems not in putting the games into practice, but in the designing stage. I did a lot of research. I was anxious because I wanted to design an enjoyable and interesting game." (E_F).

Discussion and Conclusion

In this study, a course was been designed to explain and explore pre-service teachers' perceptions toward GBL's possible usages in the PRWI process. In addition to this, the study aimed to help pre-service teachers integrate GBL scenarios into the PRWI process. The results of the study reveal that according to the pre-service teachers, instruction based on the use of GBL scenarios in PRWI increased their knowledge and skills on how to use GBL in their own teaching practices. The pre-service teachers also stated that it helped them to structure their knowledge easily, understand the content of the course better, and put theory into practice. In addition, the process helped to reinforce the information gained in the course by actively using it. They pointed out that as a result of the GBL scenarios, the course included more "fun" activities and promoted a rich learning-teaching environment. Moreover, the results revealed that pre-service teachers enjoyed the PRWI course, expressing positive views regarding participating in GBL based classes. They stated that they would like to implement game-based instruction into their own teaching career. These results show similarities to those of the study conducted by Bayırtepe & Tüzün (2007), which showed that students not only liked GBL, but also that GBL decreased students' anxiety levels. In addition to this, the study carried out by Tham & Tham (2012) revealed that university level students also enjoyed game-based instruction. It also showed that GBL promoted motivation, an increase in collaborative learning, encouraged teamwork and

socialization among students, and increased both interest and participation in the lesson; all of which are similar to the findings of the present study. In a similar vein, the study by Meletiou-Mavrotheris & Mavrotheris (2012), and Can & Cagiltay (2006) also showed that pre-service teachers exhibited positive attitudes toward using games in education and that they planned to use games in their teaching career. Furthermore, many other studies have argued that games provide learning through entertaining (Klawe, 1999; Pramling Samuelsson & Johansson, 2006; Sedighian & Sedighian, 1996).

Another important result of the current study is that it shows pre-service teachers' to have positive perceptions regarding the use of GBL scenarios in PRWI. Pre-service teachers think that GBL would not only make it easier for primary school students to learn how to read and write, but that GBL would be an effective method for evaluating primary school students' reading and writing skills. Moreover, the results also show that pre-service teachers think that the use of GBL practices should be increased in PRWI and that GBL could be used during any stage of its instruction. The pre-service teachers also believed that using GBL practices in PRWI would produce positive outcomes. Attracting and maintaining students' attention, arousing interest in the course's content, combining fun and learning, establishing an environment conducive to reading and writing, providing feedback to the teacher, making the evaluation process easier, and ensuring retention of the knowledge learned in class were also stated as being among the benefits of using GBL in PRWI by the pre-service teachers. These results are parallel with those of the study conducted by Meletiou-Mavrotheris & Mavrotheris (2012), which revealed that educational games have a positive impact on teachers' evaluation skills.

The results of this study further show that GBL based PRWI makes positive contributions to the teaching-learning process. The pre-service teachers stated that using GBL scenarios in PRWI promoted critical thinking, creative thinking, and evaluation skills. Moreover, the results showed that doing so also helped them to gain professional teaching knowledge, increase their self-confidence levels, raise awareness, provide opportunities to see different classroom applications, instill a sense of responsibility, improve imagination skills, provide opportunities to put theory into practice, and develop motivation. In the literature, numerous studies have been carried out to explore the effectiveness of educational games, all of which

suggesting that games promote motivation, provide immediate feedback, reinforce the information gained, help the development of skills, caused changes in students' behaviors and attitudes (Rossiou & Papadakis, 2007). The study conducted by Meletiou-Mavrotheris & Mavrotheris (2012) found that games helped pre-service teachers to learn through entertainment, increased motivation, promoted active participation, aroused interest in learners, and helped them learn the concepts easily. In parallel with these results, the studies by Bakar et al. (2009), Cheng & Su (2012), Dumitrache et al. (2011), Emin-Martines & Ney (2013), Holmes (2011), Pivec & Kearney (2007), and Rossiou & Papadakis (2007) revealed that educational games promoted motivation and that students had positive attitudes toward such games. In addition to these findings in the literature, Frossard et al. (2011) also found that GBL increased creativity, improved collaboration and Egenfeldt-Nielsen (2006) stated that the use of GBL boosted students' creativity and active learning. Furthermore, Holmes (2011) found that GBL provided opportunities for repetition, feedback, and improved self-efficacy. However the current study also showed that the pre-service teachers experienced some problems in the design process, the development, and use of GBL scenarios. In the design stage of the GBL scenarios, the problems most frequently faced cited were feeling anxious about the possibility of failing to prepare an age- and content-appropriate game, its being time consuming, and students' having insufficient time. In development stage of GBL scenarios, pre-service teachers' most frequently expressed challenge was feeling anxious about the possibility of failing. During implementation stage of the GBL scenarios, the pre-service teachers not only stated feeling nervous before the presentation, and feeling anxious about not being able to maintain the class's interest and curiosity, but that that there was not sufficient time to present. Interestingly, Becker & Jacobsen (2005) also stated participants' perceived lack of time as well as technical issues to be the most significant barriers to using games in education.

The results of the current study have shown that pre-service teachers feel GBL to be a useful application in PRWI courses for instructors wishing to instill into pre-service teachers professional teaching knowledge and to provide them with opportunities to put theory into practice. However, one of this study's limitations lies in the number of participants surveyed. The pre-service teachers applied their GBL scenarios in front of their friends, not in a real school environment in front of primary school

students. In a future study, the pre-service teachers' perceptions toward GBL based PRWI may be investigated after they having applied their games in real school settings. Moreover, a future study might focus on investigating the effects of GBL on factors such as permanence, motivation, and attitudes with a PRWI course. In addition, encouraging

the use of GBL in different areas of education and supporting those studies promoting pre-service teachers to use GBL scenarios in different courses may be beneficial. Finally, another promising area for research might be to explore the effect of GBL on a PRWI course by using different sample groups and sampling techniques.

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