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USE OF EDUCATIONAL GAMES IN CLASSROOM: CHALLENGES AND BARRIERS

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ABSTRACT

This study is about the challenges and the barriers that might emerge during the use of technology, specifically games, in classroom settings as supportive materials for classroom activities. In this respect, three case studies were conducted; qualitative data was collected and analyzed. The game like learning environment used in these studies was Quest Atlantis. The results are summarized under four headings: 1- technical issues, 2- Turkish educationol system, 3- teacher related issues, and 4- student related issues. The results of the study may be used by teachers, school administrators or other researchers.

Keywords: *Challenge, barrier, technology use, games.*

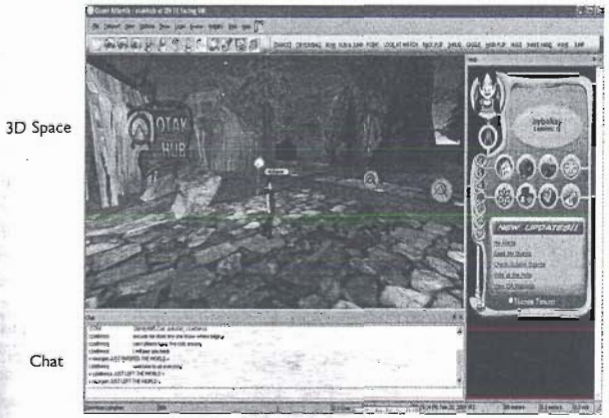
INTRODUCTION

The use of technology as a supportive tool to teaching/learning process has been encouraged most of the time by educational specialists, policy makers, or educational researchers. As the government investment and for supporting educational activities with technology, computer laboratories in schools have been established, projectors and computers, and even in some cases, smart-boards have been installed in classrooms. The aim of this study is to examine the challenges and barriers encountered in the use of computer games, specifically Quest Atlantis, in educational contexts. In this respect, three case studies were conducted in private school settings and teacher-, student-, and technical-related challenge and barriers were investigates.

Quest Atlantis

Quest Atlantis (QA) is a game designed and developed on educational purposes on the leadership of Sasha Barab at Indiana University- Bloomington. As seen from Figure-1, QA interface has three main dimensions: a 3D virtual area in which

students walk around with their avatars and discover virtual places, a 2D space to provide users with extra information through web-pages, and a chat space thanks to which users can interact with other users synchronously (Barab, et. al. 2005). On the 2D part, the users can view their *q-pods*, too. Q-pod acts like a portfolio of the students and students can access the assigned quests, e-mails and friend list, etc.



Figgure 1: QA interface

The target group of QA is elementary level students aged 9-15. QA is not only an entertaining game for the students to have fun, but also supports learning and social responsibility dimensions. Students are provided with learning opportunity through *quests*, educational activities, designed on a variety of subject area, from math to science to language. They gain lumins and cols, a point system in the game, after completing quests, depending on the complexity of the activity.

METHODOLOGY

This study used qualitative data collection and analysis methods. Three case studies were conducted in private school settings. Qualitative case study can be defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2003, p.13). This method is generally used in education when the researchers want to investigate the issues emerging during the implementation process.

In all the three studies qualitative data collection methods were utilized including student and teacher interviews and observations. Each case took place in a different school, therefore the details of each was described below.

Case Study-1

This study was conducted during the spring semester of 2006/2007 educational year. Quest Atlantis was used as a supportive tool to educational activities done in classroom setting of a 6th grade Social Science class. A virtual world was designed and developed in Turkish by the researcher in QA environment. Students studied on educational quests related with the subject they had been covering in their class.

Research Context

This school was located in suburban part of Ankara, Turkey. The number of teachers work in the elementary level of the school was 24, including one Social Science teacher. Additionally, the number of students in this level was equal to 251. There was one computer laboratory, one science laboratory, one art class and one library is located in the school building. Additionally, one indoor facility area for sport activities, one astroturf pitch, one infirmary and one refectory serve to the students.

The implementation sessions took place in the computer laboratory and there were 20 student computers and one teacher computer. The computers were connected to each other in a local area network with Internet access. There were also speaker, printer, scanner, projector, projector screen, server, hub and board.

Participants

Twenty-four (fifteen male and nine female) students participated in this study. Twenty-one students had home computer, and eighteen of them had also Internet access at home. More than half of the students (n=16) had been using computers for four years and more. Most of the students' (n=14) Internet use frequency was a few times in a week. Computer games were the most favorite software application among the students (n=22).

The Social Science teacher was a young male with one year teaching experience he had in another school. Besides being a social science teacher, he had some other responsibilities in the school and he had a loaded schedule. Therefore, he could not participate some of the implementation session. The researcher took the teacher role in class.

Case Study-2

This study was conducted during the spring semester of 2007/2008 educational year. As in the previous study, Quest Atlantis was used as a supportive tool to educational activities of a 7th grade Science class. An existing virtual world with its core narrative was translated to Turkish by the researcher considering the needs of Turkish

students, teachers and the objectives of the curriculum. Based on inquiry learning approach, the narrative aimed to make students beware of environmental problems and its multidimensionality. The narrative was re-written around the pollution of Kızılırmak and students tried to solve an environmental problem that caused the decrease in the fish population living in the river.

Research Context

This private school was located in the central part of Ankara, Turkey. Compared with the school in Case-1, this school was a bigger one including 2138 students. The school had been teaching at kindergarten, primary and high school levels. This school also had been supporting technology use; language and science labs were equipped with computers and video technologies. There was computer, projector and smart boards in classrooms. The school also had swimming pool, one indoor facility area for sport activities, art and music classes, traffic education area, play area and a library.

The implementation sessions took place in the computer laboratory, and also some meetings were done with students in their classroom environment. There were 28 student computers and one teacher computer in the computer lab. The computers had Internet access. There were also a server, a projector, a projector screen, a printer and a scanner in the lab.

Participants

Twenty (thirteen male and seven female) 7th grade students participated in this study. All of the students had home computer and also Internet access at their home computers. All of the students had been using computers for four years or more, except for one who stated that s/he had been using for two to three years. Twelve students said that they used the Internet every day whereas six other stated they used a few times in a week. Games were the second mostly used type of software application among these students (n=19).

The teacher who had a Science class with the students participated in this case was an experienced senior female teacher and she got retired after completing that educational year. She was the head of Science-teacher-group (zümre). She was responsible from many activities in the school so that she was a loaded teacher, too. However, she tried as much as she could do, helped the researcher with classroom management and tried to motivate her students.

Case Study-3

This study was conducted during the spring semester of 2007/2008 educational year. As in the previous Science project (in Case-2), QA was used as a supportive tool for the classroom activities of a 7th grade Science classroom. The same virtual world was used and students worked on the environmental problem. This study and the previous one was conducted in-parallel-time with the related subject of 7th grade curriculum.

Research Context

The third school was also located in Ankara, Turkey. The school had around 3000 students. The school had computer, science and math labs. It also had culture and convention center and areas for sport activities. This school had also been following technological innovations and supporting classroom activities with technological applications. The students were taken to computer labs during semester where they had been completing activities on variety of subject areas. There were computers and projectors in classrooms.

The orientation of the environment was done in classroom setting, but the implementations took place in the computer lab environment. There were 24 student computers and two teacher computers in the computer lab and all of them had Internet access. There were also a projector and its screen, a board and a scanner in this environment.

Participants

The number of students participated in this case was equal to twenty-four with the equal amount of female and male students. All of the students had home computer with Internet access. Additionally, all of them had been using computers for four years and more. Fifteen of them stated that they had been using Internet for a few times a week. Games were the second mostly used type of software application that the students had been using (n=23).

The teacher in this case was a young female teacher with 10 years of teaching experience. As in the previous two cases, this teacher's work load was also excessive. Due to curriculum load and some other school-related tasks all the three teachers had almost no time for other activities.

Results

The challenges and the barriers that emerged during the implementation of any of three case studies are explained in detail below. The details are given under four

main headings: technical issues, Turkish educational system, teacher perceptions and student perceptions.

1. Technical issues: The use of QA requires computer and Internet accessibility. Additionally, in order to make each student use a computer actively during the implementation sessions, it was necessary to have an equal size of computers to students.

In the first case study, the number of computers was less than the number of students. This caused conflict among the students because each of them wanted to use a computer individually. This problem also brought classroom-management problems with it.

Other barriers were electricity cut and lose of Internet access. It was already limited time to complete each session. Each class hour was 40-minute-long. When there was a technical problem, inevitably, that day ended up with the cancellation of implementation. This problem also caused decrease in students' motivation.

Another barrier emerged related with Internet speed and capacity of school computers. Since the game downloaded its objects from an Internet server, it took too much time to load the objects of a just-visited-virtual world when the Internet speed or computer capacity was low. The game got stuck, students had to wait for a while since all the objects were downloaded; and therefore some students lost their interest when this challenge occurred at the middle of an activity.

2. Turkish educational system: The first challenge was about the nature of constructivist learning. Just as the teacher in the first case stated that, constructivism requires less number of students in classrooms for an effective learning process in which the teacher is interested in each single student and therefore s/he can follow their individual progresses and manage considering student needs. Even though private schools were selected as research context in this study, the number of students in case-1 was more than the number of computers. As the game also had bases on constructivist approach, it was a challenge to use it with crowded classrooms.

Another problem about the educational system was SBS exam, that was kind of examination applied at the end of each elementary grade level. Although current curriculum was re-designed based on constructivist approach, the exam system still existed and the students were evaluated according to the exam results they had to enroll in each three year. This dilemma affected some of the students' attitude; there was one student who asked the teacher if he would not play it since he had been getting prepared for SBS exam. Another issue was parent attitude; since their children was to enter SBS exam, some of them wanted their students not play a game, although it was about course-related subjects. Of course, this issue was not only related with Turkish educational system; it was also related with students' and their parents' previous attitudes toward games - games were played for fun, not for

learning. However, the exam anxiety on students and parents was a critical factor here, too.

Another problem was curriculum load: the teachers were supposed to complete a loaded schedule till the end of the educational year, and they were already provided with each single activity to implement in their classes. QA required additional time for students and teachers to get used to the nature of the game. Although the game was introduced to them months before the implementation, they had problem with understanding game aspects. Additionally, the schools could provide less time for the implementation than needed. This was also related with their lab conditions in schools.

3. Teacher-related issues: The first issue was about the previous challenge: curriculum load. As in this study, when a researcher went teachers with an idea of educational innovation to be implemented in classroom setting, they wanted to do it in their classes; however, they had also limited time to do so. This was why they did not play the game before the implementation, and therefore they could not facilitate the sessions. The researcher took the role of facilitating student activities. In addition to curriculum load, the teachers in all three cases had extra tasks in their schools. This was another challenge influencing their interest in the game. Even in the first case, the teacher could not come some of the QA class hours.

Another challenge was that the field teachers were not accustomed to use technology in their classes, especially to the use of games. It was an innovative way of teaching for them, so that they had difficulty with it. Therefore, they left implementation part to the researcher. They also needed technical support at that point because they had limited knowledge of technology use in their classes, especially when the case was the use of a complicated game environment.

4. Student-related issues: Although they were supposed to complete educational activities, QA was a game for the students and the games were something to have fun. There were many charming game elements on their screen. Therefore, it required extensive effort to ensure classroom management.

Related with the previous issue, some of the students wanted to play the game as much as possible. Therefore, they tended to finish their tasks as soon as possible. In order to do this, some of the students copied and pasted information directly from Internet sources. Some other did not want to do anything at all. It was also not a learning method they got used to. Therefore, teacher responsibility increased at that point: they had to motivate their students and explain it enough to make their students believed in that they could learn through the game.

In the cases 2 and 3, the implementations were conducted at the end of the educational years, because the related subject was at the end of the schedule. When the implementation started, the students had already took their grades and they knew QA activity would not have any effect on their final grades. This was another

challenge causing disinterest at some of the students. Although the curriculum was based on constructivist bases, grading was still important for the students and it was an important challenge for this study. Even in the first case study, the students were asking if their QA successes would affect their class grades. They were expecting to get some extra points since they had been spending extra effort and time on something extra.

CONCLUSION

As seen from the results above, the use of games, as technology-based implementations in classroom settings, is a complicated issue in relation with all the dimensions of the educational system including teachers, students, curriculum and the technical utilities. Not only is the classroom setting a complex issue but the implementation of QA.

There are critical issues that need to be considered for a successful intervention of a game in the educational settings. In fact, before the use of the game, the attitudes of people should be a serious concern to think about: the existing opinions and beliefs of people (school administrators, teachers, students, even parents) may be a significant barrier on the implementation. The idea of learning through games should be explained enough to make them regard games as a something more than a spare time activity, which is something including violence most of the time according to them. The game used in this study was especially the one developed for educational purposes. Nevertheless, there were parents perceiving it as a "game" intercepting their children's school works.

Another issues was about continues support. The field teachers, unfortunately, were not experienced on technological applications especially on the use of a game like QA. It was valid for the students, too. Therefore, both teachers and students needed continues-support during the implementation process. Before the implementation began, orientation sessions were arranged and performed. However, QA was an innovative environment for them and therefore, the support by the researcher was vital for them.

The nature of Turkish educational system was another important challenge for the implementation of QA. It was too loaded and very much systematic. The teachers were given every single activity to perform in their classes during the educational year although it was a constructivist curriculum and it needed to consider that the students and the teachers might have different needs. As an intervention to the classroom environment, QA was something external. Although it needed longer time of implementation, curriculum, time limitations and teacher load were barriers influencing this intervention. Additionally, SBS exam and grading system were other critical issues affecting student behaviors.

In conclusion, this study showed the potential challenges and barriers that may emerge during the implementation of an educational game in classroom settings as a supportive material. The results showed that the implementation of game in class environment was a complex issue and implementers should consider many dimensions of educational system.

SUGGESTIONS

As concluded above, the implementation of QA is a complex process; and therefore it requires preliminary work before diving into the actual activity. Especially, student orientation, teacher training and continuing support gains very much importance at that point. The people who want to do a similar intervention should ensure these issues before getting started.

In order for effective use of game like environments in formal educational settings, the school administrators and teachers should ensure parent support. Additionally, since the implementations are very much affected by technical conditions, the school administrators should give support for better technical conditions.

As stated before, QA implementation requires extensive time mostly because it is an innovative learning environment and time is needed for students and teachers to discover and learn using it. Moreover, the type of activities (quests) includes extensive and detailed student work. Nevertheless, the curriculum is given to teachers and they are supposed to cover each single subject during the educational year. Since these types of implementations are very much influenced by time issues, the researchers, or the teachers, should either plan a small-scale study or use it when they are able to find extra period of time.

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