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S10- Move to Learn: Designing and Developing Kinect-based Games in Education

Fatih İLHAN*, Erman YÜKSELTÜRK

Kırıkkale University

Video games gets increasing attention and space in our daily lives as an interactive entertainment media. The research on the advantages and disadvantages of games are broadening as well. Especially cognitive and psychological effects of games are inspected in educational literature. However there are some new properties to games as new technologies emerge. Motion based games are one of them, requiring users to be physically active as well. Technologies such as Nintendo Wii, Microsoft Kinect, Sony PlayStation Move have made movement-based sports video games, and exergames highly popular. These developments might create new opportunities for improvements in some educational contexts. This study aims to point out that one of them is coding educational games. Particularly Kinect and Scratch was used for this purpose. The Kinect is a motion sensing input device developed by Microsoft for use with the Xbox 360 video games or a Windows computer. The second version is also produced and sold together with Xbox One, though version 1 was used for this study. Using a sensor, users can control and interact with the games through gestures and spoken commands. In education, Kinect may be used to enhance classroom interactions, to increase classroom participation, to improve teachers' ability to present and manipulate multimedia, and to create opportunities for interaction and discussion. Students can utilize the bodily information gathered by Kinect with software programs to create highly interactive multimedia works. One of those educational software is the widely used Scratch (<http://scratch.mit.edu/>). It is an educational programming language developed by MIT that simplifies programming so that kids can explore and learn the basics of software development. There are many extensions and improvements being made on Scratch. As one of them Kinect2Scratch was developed by Stephen Howell (<http://howell.azurewebsites.net/kinect2scratch/>). Kinect2Scratch allows kids to interact with software program they developed, without having to touch the screen, the keyboard or a mouse. Figure1. Kinect2Scratch running simultaneously with Scratch The goal of this study is to discuss how to design and develop Kinect-based games with Kinect2Scratch in education. Particularly mathematics subjects geometric shapes, and the four operations were selected for the content of the two games we developed, targeting second grade students. Geometric shapes game requires player to draw basic shapes like triangle, square, circle etc. one by one. Player draws the shapes on the air with their right hand gestures, and moves the cursor on the screen to follow the paths and reach the corners of the shapes. Figure 2. Geometric shapes game. a) Following the path to reach the corner. b) Informing message of the properties of the shape after completing the drawing. Four operations



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game consists of five levels, addition, subtraction, multiplication, division, and mixed of the four. Each level has nine questions with three different difficulty levels. Questions and their answer options are entirely randomly generated each time, considering the difficulty levels easy, moderate and hard, having three questions each. Player uses their right hand to reach towards the correct answer up in the air, and if right catches the balloon, thus increasing their score. Figure 3. Four Operations Game. a) Addition level moderate difficulty. b) Subtraction level hard difficulty. As a result, Kinect has great potential to enhance classroom interactions and to support student creativity. We will summarize the advantages of Kinect while using it in classroom environment in this study. Furthermore, we will mention the limitations of it and give some recommendations for teachers, such as, arranging large classroom space, considering calibration process and coping with pedagogical constraints.

S11- Programlama Eğitimi için Kullanılan Bir Oyunun İncelenmesi: Light-Bot

Burcu Berikan^{1*}, Şahin Gökçearsan¹, Funda Erdoğan²,

1 Gazi University

2 Dumlupınar University

Examining a game used for programming education: Light-Bot The Light-Bot is a web-based game designed to teach people from different age groups programming. Besides increasing interest to programming education in the world, our courses are inadequate to teach programming in Turkey. For this reason, in Turkey, it is becoming crucial having activities that can develop programming skills outside of the school. Therefore, it can be said that digital games that contribute to the development of programming skills close a big gap in Turkey. There are many digital games designed for programming education. Some of these games are text-based and are not suitable for used by illiterate children. Light-Bot is an icon-based game, designed also for used by students who are illiterate. Although game designers have included educational objectives in the promotion of games, it is important to evaluate such games in pedagogical terms by researchers before using them in lessons. The aim of the study is to evaluate the educational outcomes of game by collecting data from experts based on their classroom experiences and test students in terms of predefined outcomes. Three teachers should be teaching programming and using the game in their own courses and two academicians should be doing researches in the field of programming education are involved in study. In interviews with teachers, the educational outputs of the game and questions about the emotional status of the students were included. In the questions under the theme called Educational Outputs, programming concepts and skills are included. The research questions related to students' emotional states; observations of teachers related to the motivation of the students that taken in consideration of the indicators such as difficulty, excitement, and embarrassment. In interviews with academicians, it was asked to critically evaluate the game whether the educational outputs specified by the teachers overlap with the mechanism of the game. Finally, with the test includes open-ended questions are asked to the students played this game before is applied to evaluate the concepts and skills that experts think the game teaches. The collected data were analyzed with descriptive statistical methods and content analysis method. As a result of the data analysis; under the theme of educational outputs, programming concepts, skills and the thresholds for skills and concepts are explored. For educational objectives; function and loop concepts have come to the forefront as powerful aspects of the game. Whereas, it is discovered that the data types and structures that have an important place in programming have not been taught in the game. In addition to concepts, problem solving, abstraction, pattern recognition, modular thinking and debugging have become the forefront codes for programming skills. The data obtained from the students by asking them to define the concept of function support the findings obtained from the experts. Students use modular thinking skills while explaining the benefits of using functions. In addition to



this, it was discovered that the students divide the problem into small pieces and discover the patterns while forming a function, and this finding supported the observations of experts. In the collected data related to the emotional state of the students; the code of not having any holistic context in the games came to the forefront as negative code in terms of persistence of motivation. At this point, it is suggested that the game should have a holistic context. Moreover, the game have been criticized for not being able to award students who complete their tasks with much fewer steps and more efficiency. The game just gives the maximum number of steps that can be used in problem. It is suggested to improve the design of game by adding rewards considering the efficiency. In the study, as well as expert opinions and data collected from the students, descriptive statistics related to variables such as level of fun, relevance to programming, level of difficulty were given as percentages. To sum up, it is seen that Light-Bot is beneficial to create mental models that make students ready to programming and teaches some programming concepts and skills. As a result of the study, it was discovered that this game does not support data types and constructs concepts that are important in programming. In this regard, it is thought that this study might be beneficial for the practitioners and researchers who plan to use that kind of games in the programming education to strengthen the weak ways of the games.

S12- Minecraft education edition: Learning community analysis

Şahin Gökçearslan^{1*}, Funda Erdoğan², Burcu Berikan¹

1 Gazi University

2 Dumlupınar University

Games help children integrate their inner world with the outer social world. Games that change children's physical, social and psychological development by amusing them teach them to tolerate and respect other people within the group (Başal, 2007). Games are not only played by children. Mankind has played different games in different geographies and cultures and sometimes different and sometimes similar games since ancient times (Kukul, 2013). Games make us experience a variety of developmental processes such as facts about situations, skills, decision making processes, behavioral change, interpretation, rules, processes, creativity, language development, observation and communication (Prensky, 2001). The first digital computer game was introduced with the name Spacewar in 1961. This game refers to a learning experience with all its features. (Morreim, 1991). With the widespread use of personal computers in the 1980s, digital games became available to more people. At that time games conducted to the sales of millions of computers. Digital games offer a variety of experiences to individuals. Digital games offer simultaneous response and deep learning experiences for people to recreate themselves in new worlds (Gee, 2003). Many digital games have been presented to users. The Nintendo company has announced that the popular and old Mario game has sold 240 million units worldwide (Plunkett, 2010).

Minecraft has reached 58 million users (Minecraft, 2018). In a study conducted with secondary and high school students in Turkey, Minecraft has been on the fifth rank among 21 game types that are played the most (Taylan, Kara, & Durğun, 2017). Various studies have been conducted concerning that platform which has reached so many users and also has an educational aspect (Short, 2012; Schifter and Cipollone, 2013; Lane and Yi, 2018; Tessler, Givony, Zahavy, Mankowitz and Mannor, 2017)

Games and training tend to be mentioned together on many platforms. Microsoft conducts studies to participate in educational projects and has put signature to a remarkable project. Having purchased all the product rights from the Minecraft producer Mojang since 2014; Microsoft aims to offer a training version of the product in 41 countries in 11 different languages (Tatari, 2016). What makes Minecraft popular is that the game combines the components of aesthetics, sensibility, mechanics, continuous development and creativity in a fascinating way. Minecraft is considered not only a game, but also a platform developed for new meaningful experiences. (Duncan, 2011).

The Minecraft training edition offers a platform promoting the development of 21st century skills for learning environments. Teachers are able to share the lessons they develop with



their stakeholders in learning communities. By this way, they share experiences about learning objectives regarding courses, student activities and performance expectations in learning communities. There are many experiences on the platform regarding a number of lessons from mathematics to chemistry and computer science. The Minecraft learning community allows teachers to share. Wilson and Ryder (1998) define a group that supports each other on learning platforms as a "learning community". Teachers help each other in solving a problem by participating in the community (Palloff and Pratt, 1999). It creates an ideal sharing and learning environment for groups working away and an ever-developing platform. On the other hand, it is believed that a profound analysis of views in learning communities will contribute to educational outputs.

The objective of this study is to analyze the posts the learning community on the Minecraft training platform profoundly. According to that objective, an analysis will be carried out on the basis of qualitative data to reveal the scope of teachers' experiences. The data acquired will be analyzed with descriptive analysis method, which is among qualitative data analysis methods (Yıldırım and Şimşek, 2000). The post sent by teachers in the community called “general” are more than 200 and on various subjects. It is believed that analyses to be conducted regarding the posts of a real and non-formal learning and sharing community will guide teachers and researchers working on this subject.

Keywords: Minecraft, learning community, community posts

S13- An Authoring Tool for Interactive Fiction Games: Twine

Süleyman Eren Yürük

Firat University, Education Faculty, Computer Education and Instructional Technology Dep.

The intense interest in digital games by the new generation has driven many sectors into action by triggering the development of many professional games in a wide variety of genres. Games have attracted great attention of not only children but also educational researches with the pedagogical potential they own. Just like the transformation of games and pedagogical insights, academic studies on gaming is constantly gaining new dimensions. At this point, of course, games have witnessed the development processes of technology and have undergone various transformations. Games are gaining ever-increasing user control from two-dimensional graphics-based game boys to multi-player online mobile games. This has allowed the interaction dimension to become increasingly important in game scenarios. The elements of interaction are increasingly attracted to the mechanical framework of today's digital games in order to provide a meaningful experience. Through the history of digital games, these two elements complement and enhance each other more and more each day. In the process of the search for meaning in the contemporary age, interactive fictions have been rediscovered and put into practice by way of practical experience of well-known fiction authors. Interactive digital narratives cover a growing area of computing and artificial intelligence, housing a large number of artistic and gaming assets. Interactive fictions can provide the discovery of characters, plots and contexts, through adventure games, historical simulations, engaging stories, or experimental digital arts. In a highly interactive digital narrative, it is possible for users to select their own story in a large fiction pool by creating various decision combinations with dynamic tasks and background scenarios. This genre of game, which is called "Choose your own adventure", first appeared on the market in the 1980s as book chapters, and the latter was adapted to digital games. One of the criticisms of the rejection of video games as an art form is the lack of diversity of experiences. But this criticism can be answered with the different narrative game scenarios as the "choose your own adventure" game genre developed and accepted. While there are many games developed by professional teams in this genre, there are also other types of authoring tools that allow game development without requiring programming knowledge on the professional level. There are some tools that allow amateur users to independently produce digital games and to publish their work on the internet at very low cost or for free. Some of these tools are two-dimensional and three-dimensional graphics-based software, while others are only text-based and scenario-driven. Among these tools, Twine (twinery.org) is frequently used and stands out among its counterparts. The purpose of this research is to examine Twine, which makes it possible to design games in the form of choose your own adventure. In the study document analysis was used within the qualitative approach. It is an open source, HTML-based free authoring tool developed by Chris Klimas.



As well as Windows, MacOS and Linux packages, it is also accessible online via web browsers. it is an environment that can be used by teachers at every stage from elementary school to university. In addition to the development of skills such as decision making, creative writing and problem-solving, it also allows for simulating historical facts. This structure, which adopts a non-linear instructional design, can include activities based on discovery and problem-solving which are expected in contemporary multimedia. As a result, when used as a game designing tool by students, they can be used for skills such as narrative editing, algorithmic thinking and creative writing; and when it is used as an instructional game, it contributes to the development of skills such as selection, decision making, discovery and problem-solving.

Key words: Authoring tools, Choose your own adventure, Interactive games, Twine

S14- Examination of Most Played Mobile Games in terms of Digital Skills and Risks

İdris Göksu¹, Engin Kursun², Alper Aslan³, Yiğit Emrah Turgut⁴, Önder Yıldırım⁵

¹Mardin Artuklu University

²Ataturk University

³Munzur University

⁴Recep Tayyip Erdoğan University

⁵Erzincan University

Along with increased mobile device usage, demand for mobile games is also increasing. The intensive use of mobile games also requires guidance in this sense. Although the content rating standards such as Entertainment Software Rating Board (ESRB) and Pan European Game Information (PEGI) guide the individual in order to play appropriate mobile games, analyzing games with scientific methods will make this guidance process more effective. It is important that the existing rating standards are insufficient when cultural factors are taken into account and therefore the relevant games should be examined not only in terms of the risks involved but also in terms of the skills they have offered. In this context, the aim of this research is to examine the most played mobile games in terms of digital skills and risks. To do this, the most played games in play store which are Clash of Clans, Subway Surfers, Clash Royale, Candy Crush Saga, My Talking Tom, 8 Ball Pool, Shadow Fight 2, Pou, Hay Day, Hill Climb Racing, Temple Run 2, Farm Heroes Saga, Sniper 3D Assassin®, Dragon City, Candy Crush Soda Saga, Traffic Rider, Hungry Shark Evolution, Angry Birds, Real Racing 3 and Traffic Racer games were examined by the researchers. The probable skills that these games can provide are examined in the dimension of technical, information management, communication, collaboration, creativity, critical thinking, problem solving, ethical awareness, cultural awareness, flexibility, self-direction and lifelong learning. In addition to the skills offered by these games, the risks they may expose like violence, crude language, sexual content, gambling, drug and tobacco use, discrimination, ideological elements and theft are also examined. In this research, document analysis were used. The researchers examined games by actively playing them and watching videos related with those games. A total of 20 games were examined and the probable skills and risks for each game were evaluated as none (0), low (1), medium (2) and high (3) for each game. In addition to this, the presence of the skills and risks were justified by giving example screens from the games. The findings of this study revealed that the games examined have the potential to provide its players problem solving ($f=12$), critical thinking ($f=11$), lifelong learning ($f=8$), technical ($f=7$), self-direction ($f=7$), cultural awareness ($f=6$), information management ($f=6$), collaboration ($f=5$), creativity ($f=4$), communication ($f=2$) and ethical awareness ($f=2$).



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However, none of the games reviewed provide flexibility which is the skills to adapt one's thinking, attitude or behavior to changing ICT environments. On the other hand, violence, fighting, weapons or blood elements were found in the 8 examined games. It has been found that almost all the games reviewed ($f = 17$) encourage the player to spend real money. In some games ($f = 4$), ideological elements were encountered. Interestingly, it has been seen that one of the games examined is trying to normalize theft. On the other side, it has been found that none of the games examined exposed players to risks such as crude language, sexual content, sexual dialogue, tobacco use, drug use, discrimination and racism in the games. However, in spite of the majority of the games reviewed have PEGI3 or PEGI7 degree, the player is encouraged to pay real money and games have risks are a matter to be emphasized. It is thought that the results obtained in this study are likely to contribute to both children and parents while choosing appropriate mobile games. The constantly evolving mobile gaming industry is driving the development of existing games as well as the emergence of new mobile games. Hence, there is a need for mechanisms that allow mobile games to be examined in the context of risks and skills in a way that is sensitive to cultural values.



S15- Examination of Secondary School Students' Digital Game Dependencies and Responsibilities for Learning

Hüsniye Biçer¹, Agah Tuğrul Korucu²

1. Yüksek Lisans Öğrencisi, Necmettin Erbakan Üniversitesi, Ahmet Keleşoğlu Eğitim Fakültesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

2. Yrd. Doç. Dr., Necmettin Erbakan Üniversitesi, Ahmet Keleşoğlu Eğitim Fakültesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

The games that have been played throughout the human history, for various purposes such as education, development, socialization and entertainment have seen changes after computers and the Internet came into our lives. Traditional games played in parks and on the streets have left their place to digital and virtual ones. The games played in these new environments have both positive and negative impacts on children including their responsibilities, academic success, communication skills and interaction with the social environment. The children interest in digital games, excessive leisure time and uncontrolled use etc, have been resulted in a form of addiction. Focusing on the secondary school children, the aim of this study is to examine the relationship between their levels of dependency on digital games and their responsibilities towards learning. The study was conducted with the participation of 320 students, in 5th, 6th, 7th and 8th grades, who are studying in different middle schools in the province of Konya in the academic year of 2017-2018. Quantitative research method was adopted in the research and screening design was used. The demographic data form prepared by the researchers was used to collect information such as gender, age, class, education level of the family, the Internet and computer usage time. In addition to this, 'Digital Game Addiction Scale for Children' developed by Hazar and Hazar (2017) and 'The Scale of Responsibility Towards Learning' developed by Yakar and Saracaloglu (2017) were also put into use in the research. SPSS 21.0 program was used in analysis of data. The findings of this study suggest that there is a meaningful relationship between digital gaming dependency of the secondary school children and their learning responsibilities.

Keywords: Digital Game Addiction, Learning Responsibilities, Secondary School Students.

S17- A Game-Based Approach to History Education: Mission US

Süleyman Eren Yürük

Firat University, Education Faculty, Computer Education and Instructional Technology Dep.

Constructivist learning philosophy is recognized as the most contemporary educational concept of the 21st century. It is the fundamental theme of this philosophy that learners take an active role in the education process, experiencing real-life problems and delivering solutions. Due to these characteristics of constructivism, history education has some disadvantages in implementing the constructivist approach due to the inherent nature of past events and experiences. But with the developing media tools and environments, it has become possible to transfer almost any kind of educational message to the recipient. The increasing level of human-computer interaction as a result of the integration of the technological advances of pedagogical power, which multimedia possesses, has made it possible to create many scenarios-based teaching environments. Digital games, as the strongest representatives of this transformation, are strengthening their place in the 21st century especially among the young generation day by day. Rather than sequential, prescriptive learning experiences, digital games have also gained features and interactions based on uncertainty, non-linearity, discovery and problem-solving. The games that take the user into a story, make them to think, decide and choose through interactions and determine the results according to the selections thus make it possible to design constructive teaching environments in history education. While today's traditional multimedia witness these features turning into contemporary multi-media, there is a strong potential for history education. With this great power of pedagogical methods combined with technology, many instructional designs based on real-life problem for history education have become possible. It is said that traditional approaches to teaching are following a vicious course when considering students' inadequacies on the subject of history consciousness. So an investigation found that the adequacy of history ratio was about 17% among the students. However, history education hosts societies' achievements such as developing national consciousness, historical empathy, critical and ethical thinking. The possibilities offered by digital media for the implementation of the constructivist approach and the multimedia-based instructional designs developed on this basis reveal the necessity to develop materials that can respond to the current infertility of history education. The purpose of this study is to examine the Mission US (www.mission-us.org) game project, which was developed by an American gaming company for the purpose of recruiting important events in American history to secondary and high school students. Mission US is defined as a serious game project that is educational beyond purely fun. The project was first presented with 1770 US independence, 1848 anti-slavery rebellion against the slavery, and three different games involving 1866 Indians-US relations, followed by the 1907 migrant movement and the 1929 economic storm. The games are designed with a very rich planned scenario and the experience and decisions of a user-controlled character are directed. In the



study document analysis was used within the qualitative approach. The examination of the game is limited with the "For Crown or Colony?" 1770 American war of independence among the five games under the Mission US project. The game is about a character of Nat, a 14-year-old, who starts to work as an apprentice in a printing house, defines the environment in which historical events occur, decides on the tasks assigned to him, and determines the fate of himself and society under those circumstances. According to the findings, it was seen that the game design was frequently given to learning activities based on constructivist, cognitive and behavioral learning theories, and the players experienced a rich and powerful learning experience. The study has been concluded by giving preliminary results of the relevant studies and various suggestions on the history teaching program applied in the Turkish education system.

Key Words: Constructivism, Interactive games, Choose your own adventure, History education

S18- Gamified Guidance in Virtual Worlds: Examination of Cognitive and Affective Outcomes

Türkan Karakuş Yılmaz*, Asiye Kalkan

Atatürk Üniversitesi

Virtual worlds are three-dimensional virtual environments that are used over the Internet, where the user is represented by an avatar. In these environments, real world-like areas can be designed with 3D objects. These environments are synchronous environments, and users represented by avatars can see each other, communicate and collaborate. Many multimedia items such as 2-D pictures, videos, presentations can also be used in these environments. Users interact with both these materials and 3D objects. Cooperative, experiential, inquisitive, and exploratory learning opportunities based on constructivist learning seem to be frequently used in these environments where many technologies coexist.

Virtual worlds are flexible environments, where users can easily navigate and discover the environment. It is important to provide a well guidance in the design of educational environments to prevent this flexibility from missing learning elements. This guidance may be in the form of directing the users by different objects as well as by the teacher existing in the environment. This guideline must be well planned, especially to ensure that younger learners focus on learning elements. In this study, the effects of guidance designed in two different ways on students' cognitive (knowledge level) and affective (flow and attitude) outcomes were examined. The developed environment enables the students to learn the characteristics of short track, which is one of winter sports, equipments, necessary clothes and basic rules while at the same time practicing on a virtual track. For the study, two different environments were designed by using the Second Life platform. In the environment where guidance is designed with a flexible approach, the students were not spatially restricted, but the way to follow was shown using many guidance elements. In the gamified guidance environment, 6 different game mechanics and some temporal and spatial restrictions were used.

134 students, 73 girls and 61 boys, participated in the study from a middle school in Erzurum province. One week before the practice, the students were tested for short track sport knowledge. The students were played and divided into groups of equal size for flexible and gamified guidance, and a seminar on virtual environment was given to students first. Later, the students experienced the virtual environment for 90 minutes. After the implementation, short track knowledge test and additionally flow and attitude scales were applied. In addition, structured interviews were conducted with 72 students and it was aimed to reveal the outcomes such as perceived flow, attitude and learning.

As a result of the analysis, it was found that in the gamified guidance group, the attitude towards the learning of winter sports in virtual worlds and the flow level were significantly



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higher than the flexible guidance group. In addition, the interview results showed that similar learning objects were more engaging and instructive in the gamified guidance group.

It is believed that the environment in which the gamified guidance is used gives a more effective learning experience because it appeals to the auditory organ with audiovisual elements, makes the learning more interesting with different interaction-communication possibilities and attracts the individual into the environment with the game elements it contains. The limitation of the user environment in the gamified guidance, the necessity for the user to obtain the necessary information to progress in the environment and perform certain tasks, and thus the more interaction with the learning materials, strengthens the learning experience. On the other hand, the transformation of the virtual world into games has reduced communication and socialization among students. For this reason, the virtual world's flexibility and the use of different game mechanics and dynamics are suggested in the design of game-like learning environments in virtual worlds.