

**A Case Study on the Readiness of 5th Grade Primary
School Students on Understanding the Concept of
Programming Languages through Minecraft**

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ABSTRACT

In this research, the orientations and problems of programming lessons were investigated using GBL to see the readiness of 5th grade students in computer courses. The study was carried out with a total of 63 participants who were studied in 5th grade in Eastern Mediterranean Doğa College. As a result of the collected questionnaire and interview questions, it turned out that the game-based learner helped the students in certain programming instruction which was the result of the participants' answers. According to the results of study, the students found that the activity was educational and instructional through the GBL. In addition, the teaching and learning was successful at a certain level even though students look prejudiced on programming lessons.

Keywords: Game-based learning, Minecraft, Programming courses, The readiness of primary school students.

ÖZ

Bu arařtırmada 5'inci sınıf öđrencilerin programlama derslerindeki hazırbulunuřluklarını görmek amacıyla oyun-tabanlı öđrenim kullanılarak, programlama derslerine olan yönelimleri ve sorunları arařtırılmıřtır. Arařtırma Dođu Akdeniz Dođa Koleji'nde toplamda 63 katılımcı ile yürütülmüřtür. Katılımcıların katıldıkları dersin sonucunda uygulanan anket ve görüřme soruları ile toplanan veriler sonucunda, oyun-tabanlı öđrenmenin belli düzeyde programlama öđretiminde öđrencilere yardımcı olduđu ortaya çıkmıřtır. İřlenen verilere göre, öđrenciler programlama derslerine önyargılı baksa dahi, oyun-tabanlı öđrenme sayesinde öđrenciler etkinliđi eđitici ve öđretici bulmuř ve aynı zamanda oyunla öđretim belirli düzeyde bařarılı olmuřtur.

Anahtar Kelimeler: Oyun tabanlı öđrenme, Minecraft, Programlama dersleri, İlkokul öđrencileri hazırbulunuřlukları

DEDICATION

I would like to thank my family for the financial and spiritual support that I have had since I started working as a resident. Specially, my father believed in me and my mother always think to me and her prayers. Furthermore, I would like to thank my brothers and sisters for helping me all the time.

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Chapter 1

INTRODUCTION

Increasing use of technologies in daily life have emerged in the last few years and hence, the learning process has been changing. The main purpose of the development of technology has been providing more details or adding more convenience to human life. The areas of technologies are; business, transportation, broadcasting, architecture, social media, and especially education. Due to the development of technologies, new educational types and electronical learning systems are become more popular to new teaching methods at classrooms.

Technology helps human beings to utilize the knowledge and skills acquired through education in a better and more efficient way in order to apply them more consciously. Every day, a new technological development emerges and the use of technology has become indispensable for human being in the 21st century. In this respect, world are reflected learning and teaching activities in the education system because of rapid developments in technology.

Information and Communication Technology (ICT) is the infrastructure and the basic module that provides modern information processing. Intercalary, dissemination of information play an important role in today's world and almost all human being use computers to get and share information quickly. As illustrated by Romero (2015); ICT has contributed to the facilitation of communication and has allowed new areas

of study and modes of learning to transcend traditional time and space constraints. ICT supports multimedia to get information for i.e. broadcasting, videos, pictures and sounds; hence, ICT become more powerful technic in education.

Learning and teaching process are important functions of educational technology in order to design, apply, measure and evaluate in more effective way. There is an apparent success of fundamental role of ICTs in the area of education since the beginning of 21st century. ICT infrastructure investments are key factors of evolution of policy in the field of education. In most countries, ICT equipment is in place to improve education, such as tablets, smartphones, computers and multimedia-assisted software.

ICT is an education that is aimed to understanding computer programs and applications. In addition to this, these applications and systems working with software's created by the humans. Today, residents produced valuable knowledge and skills are around computing and communication devices. The positive effect of the ICT is the ease of access to information in education. As Claro et al. (2012) mentioned that; in research conducted in the 90's, researchers realized that ICT courses beyond the technical education. It is not only to technical education students, it is for everybody.

In addition, the operating systems and system applications have friendlier interface to adopt the humans into computer world and increase usability of computer in education. Therefore, ICT literacy plays an important role in the analysis of information and development of personal skills of association, social interaction of students, getting information and participation of students in their courses. So, from

the education point of view, it can be said that, the purpose of ICT ensures the development of student's perspective of computer courses who can gain "computer literacy" to understand the ICT tools in order to use them in computer courses. ICT is also preferred to increase the sharing and getting information better and quicker during teaching and learning process. As it is stated in Romero (2015) "Nowadays, the frontiers of work, learning and social activities of the knowledge workers have blurred in the same digital environment, making the shifting possibilities between activities easier than ever". Considering the benefits of technology in education, many schools prefer to use computers at their classrooms commonly.

Universities, high and vocational schools, secondary schools, primary schools, college and even kindergarten use the computers at the classrooms. In this respect, the place of computer science is very significant in education. The goal of computer science adopt the students to a new era of digital century. Besides, almost each school prefer to use computers in their lessons due to widespread technology in the world. As Denner, Werner, and Ortiz (2012) stated that; "Efforts to get precollege students on the pathway to a computing career typically are based on at least one of the two strategies: 1) increase their interest and excitement about computing, and 2) introduce students to computational concepts and skills."

Computer game is the running of applications that can be played by using computers, X-box, PlayStation and video-games. As a general idea, computer games are act of playing games to finish the tasks step by step or stimulate the real life experiences. As mentioned by Seng and Yatim (2014); Students need to learn step by step in the game world because of understanding level of games easily and effectively. The importance of gaming in education is that the students are being forced by playing

games in order to motivate and engage their attention to their courses. As it is known, especially, the primary school students are more concerned to the games. De-Marcos, Garcia-Lopez, and Garcia-Cabot (2016) stated that; game-like education becoming popular in the teaching and learning process in order to increase adopting students in the computer courses.

Generally, games are very rich in terms of multimedia which motivate the students well. One of the most powerful way to develop the students' skills in computer literacy is game-based learning (GBL). As stated by Ucus (2015); "In GBL, the course content is mapped into the game to provide a virtual environment of learning, repeated self-learning, ongoing interaction and feedback which can increase the interest and motivation in learning." Games can be powerful educational material in computer science. As Papastergiou (2009) stated that; (a) students can promote multi-sensory, active experimental, problem-based learning, (b) students can increase their level using the previously information about the playing games, (c) students can get better status thanks to the feedback provided by the game (d) The scope of the self-assessment increases with the information about the points and games they have. And (e) students can be more social when play game with other people. Eventually, in order to increase the student's attention of Computer Science (CS) course, GBL can be a gold mine to consolidate and learnt programming languages for primary school students. As Denner et al. (2012) stated that; A number of examples have been given to learners' understanding of computer science effectively using GBL.

Whereby, students who are using ICT tools may be more effective in interpreting the multimedia and digital language of computers to improve their computer literacy

skills. In addition to this, students' abilities evolved to encode and decode of analysing multimedia and digital language of computers with the use of ICT.

The relationship between play and learning can be similar and helps students' understanding on the abstract educational materials and documents by using simulations of real life experiences. Generally, GBL is viewed as task-oriented and students can enjoy playing games in their daily lives. Most of games are motivating the students mentally and students feel comfortable while they are playing games.

As stated by Corral, Balcells, Estévez, Moreno, and Ramos (2014); students can faced some difficulties in programming languages when they are studying about the Object-Oriented Programming (OOP). There is an evidence to support programming courses and to give them CS lessons because students think that it is confusing and difficult to solve problems in programming to complete the given tasks in the courses. GBL is designed for beginners with computers that can design computer-based work in their courses. Considering the CS courses results in the universities, the results may not be satisfactory for the future of computer science. As mentioned by Prokofyeva, Uhanova, Katalnikova, Synytsya, and Jurenoks (2017); Students level of programming course is extremely low in the beginning of university life's.

As mentioned by Tan, Guo, and Zheng (2014); Many teachers accept the difficulty of programming lessons because teachers believe that; students skills about the computers need to be sufficient for programming courses. Programming language courses are hard to learn for students because of the structure of programming language courses. At the same time, the age of the students is the interval of the subjects to be taken into consideration. As stated in the research of Furió, González-

Gancedo, Juan, Seguí, and Rando (2013); “Due to its motivational aspect, playing games is considered to be an ideal resource for use at school to show overall content of the subject matter and is also considered to be the link for significant learning.” When considered the students to be trained for the programming courses, many educators can prefer to use popular educational games such as Scratch, Lego sets, Code Combat, All Can Code and Code.org in order to attract the attention in classes.

1.1 Problem Statement

The world has some concerns about the future of CS and programming language courses in order to growing rapidly in the market technology. Furthermore, students have difficulty in programming languages at universities. At the beginning of the semester, programming courses provided for CS students, but students commonly did not take any programming class at the college. The importance of early education should be implemented in CS courses to increase the achievement of students in programming language courses. In early education, when students are trained with algorithmic logic, students can easily understand the rationale of programming. As stated by Denner et al. (2012); There are lots of programming courses exercises environment exists to increase the student’s level of algorithm logic for children but there is limited research about GBL effect in programming language courses.

This research is designed to analyse the readiness of elementary school students in programming language courses. Minecraft was chosen in order to analyse 5th grade primary school student that is a game available at Code.org. It helps the purpose of research and monitor students' readiness at the computer courses when they do practice in computer courses. In addition, Minecraft is a popular game for primary school students. As it represents real life scene; all items and maps are in three

dimensional. Furthermore, Minecraft is an educational aspect of attracting for students and it is also support concept of programming courses. This educational game designed by Code.org in an appropriate way for 5th grade primary school student's ages. The Code.org website clearly states that, this game is recommended for older than 6 years old students.

1.2 Aim of Study

The main aim of this research is to analyze the readiness 5th grade primary school students on understanding the concept of programming languages through GBL.

1.3 Research Questions

A of 5th grade primary school students' will be applied to the tests that measure groups' readiness of programming language in their CS courses through GBL.

1. Are the 5th grade primary school students ready for understanding the concept of programming languages courses through GBL?
 - 1.1 Is there a significant difference on understanding the concept of programming languages through GBL according to 5th grade primary school student's gender?
 - 1.2 How does family's (mother, father, & brothers) daily usage of computers affect readiness of student for programming language courses?
 - 1.3 How does students' daily usage of computers affect readiness of student for programming language courses?
 - 1.4 How does your purpose of using the Internet effect the readiness of students for programming language courses?

1.4 Limitations

This research was done by 5th Grade primary school students which is Eastern Mediterranean Doğa College, two hour lectures and a-term limitation (Spring 2016-2017) have created a limitation in this research.

Chapter 2

LITERATURE REVIEW

At the beginning of the 21st century technology is rapidly spreading around the world and the use of technology is continue to grow proportionally. Moreover, people are starting to use more devices in their daily lives with the integration of technology. The most common area of use technology with these devices is the field of education. Integration of technology into the field of education is important for educators due to diversity of technological equipment. These devices are used by students to gain and acquire information. For this reason, companies are producing technological equipment's that continue to explore new devices that will help students research, and to improve their school-level success.

Children should learn computer literacy to develop systematic and alternative thinking skills and to see the link between cases in CS lessons. That is why, CS become popular in today's world. It is known that the skills acquired during childhood are more permanent and more effective. As Romero (2015) mentioned; "In this context, digital literacy has become one of the key competencies of the 21st century". Besides, programming education has to become compulsory for each level of students to increase adaptation of students to a new world. Therefore, GBL will help the progress of research, because games are really popular and attractive for students. As Ucus (2015) stated; Games are kind of bridge between courses and

social life and support persistent learning, and students feel happy when playing games actively.

Playing games seems to be regarded as entertainment for many people, and however there are also people who are playing games too. In addition to this, computer games are preferred by many people for entertainment purposes. Additionally, people plays computer games to fun, to gain knowledge, broad perspective, to socialize and to be relieved. According to some researches, playing games made the people smarter. As stated by Funstation, Comel, Ceria, and Schools ; When students are playing games actively, students motor skills develop extremely. It has been observed that, GBL support better teaching environment due to using games in their education. According to Bodrova & Leong (2005); “Children who engage in quality play experiences are more likely to have well-developed memory skills, language development, and are able to regulate their behavior, leading to enhanced school adjustment and academic learning”. Besides, every child are growing with playing regular games and considering effects of gaming on the children behaves, there are some benefits exist commonly in education field. According to Ucus (2005); Playing games during the courses are encourage reflection and comprehension of the learning.

Clearly, games help people to express themselves which increase their thinking skills when they are playing games. Furthermore, it has been observed that realistic games are more attractive for students. As Kiili (2005) mentioned that; games have been used in education primarily as tools for supporting the practice of factual information. There are many kind of game exit in literature such as video games, computer games, simulating games and educational games.

In kindergarten or pre-college education games can be used to train people for future business life. Computer games are earning big budget in market and they are produced by software companies. Software companies are growing rapidly in the gaming industry. One of the benefits of gaming in education is to support the students' learning at the classrooms in an enjoyable way. Kebritchi, Hirumi, & Bai (2010); "Students who played the games in their classrooms and school labs reported greater motivation compared to the ones who played the games only in the school labs".

Educators use gaming in their lessons to increase the motivation and adaptation of students in the computer courses. Computer games are increase the students adaptation and motivation in the classrooms (Ouahbi, Kaddari, Darhmaoui, Elachqar, & Lahmine, 2015). Because of that, GBL commonly used in computer classes to integrated students' in the centre of courses.

It is worth to mention that, the basic principles of the learner such as educational psychologists and pedagogues seems to be inadequate when compared with the traditional way of learning. For this issue, more practical and metaphorical are required for learning styles. Especially, though the train of thought skills fail with the traditional education system in which the practical and experimental forms are even more beneficial. It has been observed, that use of toys in the training of thought skills makes the individual to adapt faster to learn, and the brain directly affects the prefrontal cortex. Therefore, games are the powerful weapon to integrate students into the classrooms and work with them effectively. According to statement of Ucus (2015) "Games help students to develop necessary knowledge, skills and values in order to be an active member of their classroom and even in their society".

Nowadays, the traditional computer class is not attractive for primary school students. Soflano, Connolly, and Hailey (2015). “There is growing evidence to support the integration of CS into K-12 education and students often give up CS because they think it is confusing and difficult.” As Soflano, Connolly & Hailey (2015) mentioned that; computer lessons affordable for student’s, particularly for primary school students. However, games can made all process easier for students, because the computer games are attractive and enjoyable for them. To motivate the students in the computer courses, game can help the educators to increase the adaptation of students in the process of learning. In addition, computer classes support the student-centred education. The tasks given by educators in computer courses have to be finished until the end of lesson, so that the students start to take place in the centre of the course. Furthermore, in order to be able to understand the subject better, students should be active in the computer classes. As in a research conducted by Ucus (2015); GBL helps students to improve their problem-solving abilities and motor skills, their perspective and interpret society.

In addition, rules, goals, feedbacks, competitions, challenging, opposition and interaction are exist in GBL. So, students can force themselves to finish and complete the tasks defined by the educators. On the other hand, the nature of GBL includes challenging. So that, in each game student has to complete the task in order to get an award (i.e. points, certificate or honour report). Thus, success rate in classroom can be increased due to competition among the students. All these matters can be the essential part of GBL in education. The score of the games show the level of competition for students each other. Games can impact greater effect on teaching by dint of GBL.

When considering the game style of each game, all of them have a clear interface. It has a clear interface is an important factor that effects the children's understanding with the use of GBL. It should be noted that; "Most games have simple user interfaces and do not require graphical user interface (GUI) components, such as dialogs, lists, and trees" Chen and Cheng (2007).

To develop student's skills with GBL, there are some websites that integrate students into educational games. Most popular ones are for teaching the concept of coding i.e. "code.org" or "codecademy.com". As stated by Sáez-López, Román-González, and Vázquez-Cano (2016) research; "There has been a growing interest in learning to program in pedagogical contexts, driven and disseminated by organizations such as "codecademy.com" and code.org," and it is not only for future job opportunities and growing demands in this field, but for the educational advantages and benefits that coding in education provides". At those websites there are some educational games like Scratch, Frozen, Star Wars, Flappy Bird, Code Combat, Angry Birds, Code Monkey and Minecraft. Some of these games are adapted from real world for field of education at the classroom. It is worth to mention that, Scratch is the father of these kinds of games and it has really rich tools to create new programming project for students. In the direction of Sáez-López et al. (2016); Scratch is an open-source software to exercise on programming language. This program provide software creation and animations. It also helps to design a games and interfaces for students. In addition, it has clear interface to increase student's motivation when doing exercise in the program.

Programming is about communication between users and computers. It tells the computer how to behave, gives the commands and doing arithmetic process. The

programming should be done in accordance with the flow of the programs and the working principles of the computers. In this sense, there are many programming languages available to help computers' communication with people. The most popular ones are; C#, C++, Java, JavaScript, COBOL, Perl, PHP, Python, Delphi and Swift.

Each programming languages are based on algorithm in order to follow the flow. Flows direct the commands and the architecture of programming languages created by these flows in order to give the commands to computers to tell how to behave. Learning these behaviours is a way of understanding how computer hardware works. It helps the programmers while programming a software. As Sáez-López et al. (2016) mentioned that; Designing algorithm flows, coding and computational thinking are increasing almost every country each year because of advantages of computer science on country growing.

Before coding, programmers have to create flows of software to follow the process of programming. To understand the program flow, programmers need to do practice to understand the algorithm well. There are lots of games and education techniques which helps the understanding of the use of programming flow in field of education. As a summary, algorithmic thinking is in fact a movement, a situation where the programmers thinks from A to Z to help the programmers during coding process. As stated on Kiss and Arki (2017); The algorithm and flows charts is so significant for professional programmers especially engineering students too.

Before starting to coding, programmer should plan the process of things that must be done. In addition, programmers need to analyse stakeholder needs, implement

analysing reports on the project, make an experiment or pilot work and design a program end of the work during the project stage. These stage can be understandable when programmers learn the flow of algorithm. The game of Minecraft is one of the options for teaching the programming to students. It is worth to mention that, early-age learners will be able to improve their algorithmic thinking skills through the lessons they get through games like Minecraft. Briefly, algorithmic thinking is important for programmers and Minecraft support the algorithmic thinking for early-age learners due to puzzle based game feature.

2.1 GBL with Minecraft

Minecraft seems like one of the popular games in the world. It is a kind of survival game and a kind of sandbox video-games. The game was created by Mojang Company in Sweden. Users build constructions with the help of 3D cubes as a procedures generated on the map and they can create new tools in the game. The mode of the game differs according to the user's selection; either survival mode or normal mode. The users can play Minecraft through web-based or can install on their personal-computers (PC), as well as their mobile phones and tablets no matter if it is android or iOS. Moreover, it can also be played on PS3, PS4 and Xbox 360. As (Chen & Cheng, 2007) mentioned that; "Minecraft is an object-oriented (OO) programming which is one of the primary paradigms in teaching undergraduate computer programming". OO is really necessary to understand better programming languages.

Minecraft has a clear interface and becomes more comfortable when you start playing games on the website. The best part of the Minecraft is that; it is always up to date since the date when the game was created first time. Therefore when you

update the game; game interface and context will also be changed i.e. new animals, staffs, maps, the views and properties of the game. Minecraft also supports different game modes and gives options to the users to play in classic, survival, creative, hard core, adventure and spectator mode.



Figure 1: The main screen of Minecraft game in Code.org website

Figure 1 illustrates Minecraft screen, the tasks is given to the students to do. The context of the task is a puzzle and students direct themselves according to explanation on the left screen. Students lead themselves in the game and manage their own characters during the game. The task given by teacher duty is obliged to check whether the students have done their task correctly or not. At the same time, the teacher should give the information about the game screen before starting to code.

The screen is split into four main parts. The left part is the Minecraft play space where the program will run. The instructions for each level are written below. The middle area is the toolbox and each of these blocks is a command that directs

characters' actions. The white space on the right is called the work space and this is where the users build his/her program. The commands working used by codes in the middle-side of game and users manage the codes by dragging and dropping. In the same way, users can delete the codes by using same properties opposite directions between play spaces to work space. Briefly, if the students follow the directions in the game, they can build what they want within the limits of the program properties. In short, students solve a puzzle and they can increase their knowledge about the flow of algorithm by using Minecraft.

Minecraft which was designed by Code.org support student-centre education when they are doing practice on computer courses. As stated on Sáez-López et al. (2016); Learning by doing motivate the students during the courses and problem solving strategies can improve using student-oriented learning in the computer courses. As Seng and Yatim (2014) mentioned that; “Originally, the first education computer games have been designed as drill-and practice game for the learner”. As the web-based version of Minecraft does not need any installation and it can be accessed through any PC/mobile devices that have internet. It is very easy to play with any users around the world. Users can reach the Minecraft for entertainment, spending valuable time and most importantly for getting education to develop personal skills. In this study, the web-based Minecraft is preferred in order to analyse the 5th grade primary school students' readiness on the concept of programming.

2.2 Related Research

This section is focused on the advantages of the programming courses and the game-based learning on the educational benefits based on preliminary findings of the elementary school students discussed in earlier research studies. In addition, related

researches that analyse how the evolution of algorithmic thinking structures have been benefited by the students in computer courses.

Sáez-López et al. (2016); CS courses are too confusing and difficult for K-12 students, it also is school administrative ignore the benefits of computer courses in global world in order to ignorance of technologies. The study used Scratch as a GBL tool and it is applied to 107 students from 5th and 6th grade. The education environment was designed as a student-centred to integrate students actively in the research. The researchers believe that, learning by doing motivates the students well and it was thought to increase success rate of the students. Design-based research is used with different dimension of hypothesis in order to find correct data about CS student's integration of ICT courses. In the study, qualitative and quantitative methodology are used. The study observed that Scratch develops the students' skills positively in programming concepts, logic and computational practices (dimension 1) and it is so motivated, commitment and fun for students (dimension 2).

As stated on Corral et al. (2014); it has been investigated the effects of application on object-based teaching to the students and to respond to the question of how to obtain new information by using old knowledge. A sample group was selected for the implementation of the study and it was divided into two. The control group was studied the traditional C# and the experimental group take C# course by using demonstration program. To summarize, the experimental group tried to learn a part of C# OOP by playing a game and control group was only studied C# through text-based learning style. The findings of the study showed that, tangible user interface (TUI) is a tangible and visible way to understand students the main programming logic effectively during the lecture hours.

As stated on Ouahbi et al. (2015); It focuses on the motivational effects of students on basic programming, and considering the difficulties of programming lessons. In this study, game was designed using Scratch and a group of 69 high school students was selected. Basically the group was divided into two different subgroups. First group was used the game of Scratch and the other group were used Pascal programming. A questionnaire was applied for these groups and the results has been analysed through the questionnaire. According to the results, 95% of the students have never taken any programming courses before and only 15% of the students in the first group found Scratch boring. Whereas, 79.3% students in the other group found Pascal programming boring. So, concluded that, the first group was better motivated against other groups.

Seng and Yatim (2014); The research is about how games are defined and evaluated on high school students. It was a kind of the integration of GBL teaching and learning process into programming education. Generally examined the game, it found enjoyable but it was not only for children, it was also as an instructional technique at the same time. In addition, traditional programming was analysed old fashion and new techniques involved students when they did a practice. The aim of the study, in order to increase impact of student attention on the study, clean interface and simple program was used. Game was designed for students in order to increase integration of them in ICT courses and the rules of the game were given by the researchers. A quantitative research methods was used and the questionnaire includes only 10 questions. The result of the research showed that, %20 of students were female and %80 of them were male. 86% of the students found GBL better than the traditional way of programming education.

Kazimoglu, Kiernan, Bacon, and MacKinnon (2012); The effects of innovative game models on computational thinking, how they affect the skills of students, and the thinking of students who produce digital game design without any programming knowledge were investigated. Researchers have focused on how game-based influences on the learners' computational thinking and the advantages of GBL to understand the general map in programming lessons. Because of that, researchers measure the students programming skills such as; problem solving, building algorithm, debugging, simulation and socializing. In the study, "Program Your Robot" game was used in a programming course that is a kind of puzzle. The aim of the students was to design an algorithm flows in order to complete the game. 25 students participate the research voluntarily and the results showed that most of students the found that game interesting and relevant for them. Moreover, it is observer that the game has provided positive effect on the understanding of full map of algorithm flow in programming courses by using GBL.

Quan (2015); A class is designed to teach linguistic education to students in Guam University by using Scratch. In the study, a lesson plan was made for primary, secondary and high school education in order to integrate Scratch during the academic year of 2012-2013 for computer courses. In the first period of the academic year, Scratch 1.4 is used in applied linguistic courses and the researcher sent a project to the students to do it. In second period of the academic year, it was asked to do his/her own project and also the students can collaborate in each stage of designing his/her project. In academic period of 2013, students need to design their project using Scratch 2.0 that was as a new tool. Attitudes, positive and negative feedbacks of the students were examined in the academic year of 2012-2013. When

the student's project of 2012 were investigated, there was completely a lot of design gaps and ostentatious work exist to done. While in the academic period of 2013 students made preparations for the subject in general and improved their projects by focusing more on the subject.

Kiss and Arki (2017); It is examined how the game-based learners influence the analysis on a project and the algorithmic thinking of the engineering students at the programming lessons. The data collection and examination phase of the study was divided into two groups (group A and B) of 63 students. Furthermore, these two groups were divided two different subgroups. 20 students in the first group (group A) took classes with the traditional program, while the other 14 students had a game oriented education. The other group (group B) did same thing but the exercise was different only. When the results are taken into consideration, it is seen that the students who choose to game oriented programming had better learning results than those who make traditional programming language.

Wu, Chang, and He (2010); It was conducted using Scratch as a tool on GBL to observe students' anxiety and success in computer programming classes. The survey focused on secondary and high school students in Taiwan, and the use of internet and software applications has influenced the curriculum of computer science students. C++ and Java was used to solve complex programming problems and the environment of class was design by using these tools. Considering research questions, there were two different methods used for the study. Researchers ask four different questions to see the student's situation on programming courses. The other method was questionnaire that was used to collect information from students to see students' anxiety on playfulness and enjoyment of learning in computer

programming. Totally, 19 questions were available for the study in order to analyse student's enjoyment, playfulness and anxiety. The successful and unsuccessful of the students were divided and the road map was determined according to the degree of anxiety, enjoyment and playfulness in programming the orientation of the students who failed in exercises.

Chen and Cheng (2007); Object-oriented programming becomes popular, so students are being tested for their approaches and skills in programming languages laboratories. Students observed in the laboratory environment and they started programming first with small tasks because of the difficulty of object-oriented programming. At the same time, some programming subjects in the programming process is explained to teach programming tools to the students. As the period continued to progress, the assignments made by the students became more difficult. While programming a game is difficult even for a professional programmer, the students program their own games in this research. Almost each students had not good experiences about the programming. The process was continued seventeen weeks and students attempted classes ten hours per week. There are seventeen team exits in this research and two-person team organization was used. As a result of the research, it was observed that the students became better and they finished the more motivated until finish the period.

Prokofyeva et al. (2017); It is planned that the students will be more prepared in their professional lives by keeping the base of the courses they have taken in the first grade constant. At the beginning of the research, researchers have seen that first-year computer students did not perform enough in the initial interviews. In addition, the first year computer students programming knowledge was extremely low. Moreover,

most university teachers came from old generation for programming. When we consider all this, they wanted to improve the algorithmic thinking skills and problem solving skills in programming so that students become more proficient in professional life. So, they developed a working schedule and it called “Algorithmization and Programming Solution”. According to this technique, forty-eight hours of lessons and thirty-two hours of practical lessons will be given to the students. In this research conducted at the University of Riga, it has been seen that professional practitioners have a better view of professional life. Another point, students gained much more knowledge in object oriented programming.

Çatlak, Tekdal, and Baz (2015); The importance of computer science and programming courses is mentioned in today's world. It is stated that the students who take the programming courses have many problems and difficulties. The Scratch which is considered as a probing solution of programming languages has been examined from the old documents written. A document review method was used and approximately fifty three written documents were examined. However, only thirty-three written study was used for this study. The investigations mentioned that, Scratch's program was developed in the form of problem solving, creative thinking, logical thinking, algorithm and programming teaching, student views in programming, comparison with other programming languages, game programming and simulation development. The articles were examined according to these properties. According to the statistical data, the most research were related on algorithms and programming. This shows that research in programming and algorithmic thinking skills is important to programming languages. It has also been

observed that the concept of Scratch used for the understanding of abstract concepts and programming training was quite large in studies.

Bayırtepe and Tüzün (2007); The effects of educational computer games on the achievement of computer students in primary school and on computer-competence perceptions were investigated. In accordance with the objective, a computer game covering the hardware of computer lessons was prepared for elementary school seventh graders. The study was designed based on semi-experimental designs with control group pre-test and post-test experimental model. Experiment group students learned in the game environment for two weeks while control group students learned the traditional narrative based method during the same period. The research was made in Ankara/Turkey. The intended phenomenon was to see which game-based computer education and narrative computer training were more effective. As seen in recent research, primary and secondary school students spend a lot of time in computer games. It is seen that the game-based learner is more effective learner considering their spending time in computer-games.

Yükseltürk and Altıok (2016); The perspective of computer science teachers on Scratch used in programming lessons has been examined. As mentioned earlier, Scratch is important program for programming courses to integrate students actively in courses. That is why, the study was made it in a conferences and 159 students had given their opinions in 2013-2014. Qualitative and quantitative methods have been applied for the collection of data in the study. On the other hand, the point of view of teachers who give computer education to programs used in programming education is important for education. As a result of the collected survey results and the focus

group interviews, it was seen that the computer teachers had a very pleasant opinion about the Scratch.

Yükseltürk and Altıok (2015); Their perspective of computer teachers towards programming courses has been examined at Amasya University. Within the scope of the project realized in 2014, participant teachers were asked "the primary school students should take programming lessons". In this context, pedagogical training was given to the student teachers in terms of their compliance with the programming courses of the primary school students. Participation from different universities took place in the event and survey data were collected from twenty-five participants in total. The questionnaire has five Likert scale questions and three open-ended questions. As a result of the research participants stated that they were learning new techniques for programming education for students and they were introduced to new techniques used in programming education at the same time. Teachers' opinions were taken in order to educate computer science students more conscious and knowledgeable in line with the stated vision.

Utku and Tüfekçi (2016); The aim of the project is to define an artificial intelligence for computer science in programming courses which has been improved for teaching significant subjects: algorithm and flowcharts. The designed software provides full service to artificial intelligence supported education. When depending subject matter literature examined, there are lots of teaching problems exist for programming courses education. However, this research was focused main concepts of programming languages courses that were algorithm and flowcharts. So, artificial intelligence was improved and introduced by programmers and the success rate of the program has been observed. According to the steps they have followed, the

developed program gives feedback to the students and guiding them. Researchers entered the collected data into their designed programs and artificial intelligence program gave the feedback by entered values. However, the research study was evaluated by looking at the students' post-semester grade scores. Briefly, developed program which was artificial intelligence and student's education in algorithm and flowcharts was evaluated in this research. According to the conclusion, developed artificial intelligence program support the new education style instead of traditional education, the program was also liked among students.

Du, Wimmer, and Rada (2016); Hour of Code is a developed program by Code.org which is representing one-hour computer science education. In this study, students behaves and attitudes were examined to see achievement of students in programming courses by Hour of Code. This website was designed similar a catalogue and users can pick a game to teach themselves in programming languages. It is also used to schools commonly and teachers support their education using this website. Even mathematics and science teachers are using this site to expand the analytical thinking skills of their students. Students who undergraduate students was selected different two universities. Electronical survey was implemented in a pre-test and post-test format for evaluate students' attitude against programming and their programming skills. Hour of Code support game-based learning context and this website have lots of games to teach students in programming languages. Angry Birds was selected to see student's attitude in programming languages and at the end of the game evaluation was made according to the collected survey results. The results indicated, Hour of Code has a positive impact on the student's attitude and it provide advantages for teachers too much.

Erçetin and Durak (2017); Computing technologies and software courses are studied in 2015-2016 in Turkey. For this purpose, data were collected from fifty different computer teachers in approximately thirty different cities in Turkey during the fall semester in 2015-16. Researchers who argue that traditional computer training is not appropriate, they have studied computer courses and programming lesson content. Data were collected by applying mixed research method 50 different teachers in Turkey. Both qualitative and quantitative research methods have been applied to ensure consistent results. Questionnaires were used in the research and teachers' opinions were also collected by applying interview questions. The most common problem was the inadequacy of the teaching environment and the lack of practice environment in the survey. Researches said that; the correction of teaching areas and the attitudes of students are required to be changed.

Baytak and Land (2011); Study supported learning by doing which was applied for 5th grade primary school computer courses. Aim of work, researchers observe the result of learning by doing in computer courses and try to understand power of game-based learning. The process of study, students have to create functional games one by one. However, in turn, following project process was defined planning, designing, testing and sharing. Data was collected from study by observation which is a tool on case study. To design functional games, Scratch chosen program by researchers that was designed MIT University to use in computer courses. In addition, scratch support the game-based learning teaching technic and students used this program to finish their tasks. There are 10 students exist on study who were in USA. Researchers observed the 10 students around one semester and computer courses was examined within the projects. In conclusion, Scratch is a user-friendly software for

students and researchers have well result throughout end of project. Motivation of students was increased and students understood the concept of programming computer games through Scratch.

Chapter 3

METHODOLOGY

This part of thesis focused to investigate readiness of 5th grade primary school students in programming languages courses and according to mixed method research type, results show the students self-efficacy in the last year of primary school. There are 4 different classes in Eastern Mediterranean Doğa Colleges who belong to 5th grade students. Each class has approximately 20-22 students. Totally, when considering students who attempt the classes; 63 different with 11-12 were participated to the study.

A mixed method was used to evaluate the readiness of 5th grade primary school students in that research. Mixed methods are methods used to carry out a research involving summing, analysing and integrating using quantitative (eg, tests, questionnaires) and qualitative (eg, focus groups, interviews). For this reason, questionnaires and interview questions were used to evaluate the students.

In this study, a questionnaire is used to collect qualitative data. The used questionnaire is adapted from Sun J. (2011); Parveen J. A., Sanweer A. & Waleed E. F. (2014) and Keramati A., Afshari-Mofrad M. & Kamrani A. (2011). The first part have questionnaire that has two different parts. The first part of questionnaire include student's information about their gender, age and their daily usage of computer, their families daily usage of computer and the purpose of internet usage. The questions is

about context of programming and perspective of programming course. In addition to questionnaire, interview questions was asking to students to support the research. Detailed clarification will be given the following parts that's are research method, sample, data collection techniques, data analysing and findings.

3.1 Research Method

The mixed method research type was used to analyse readiness of 5th grade primary school students in Eastern Mediterranean Doğa College in Turkish Republic of Northern Cyprus (TRNC). The mixed-method research was used to collect and analyse the data in order to the make research more understandable. Harper (2013) mentioned that; “Mixed methods research (MMR), sometimes called multi-methodology is an approach to a research problem that leverages the advantages of both qualitative and quantitative research methods to better understand the subject than any individual approach could offer on its own”. This method type support two way research which are qualitative and quantitative research type. That is why, collected data and analysed data can be more validate and reliable. Questionnaires and interview questions were prepared in accordance with the research type.

The questionnaire have 41 different questions and it is consisted 2 main parts. The first part have some personal information about students such as; their gender, their daily usage of computers, their family's daily usage of computers and their purpose of internet. The questions include a questions about Minecraft and programming language courses context. Generally, the questions measured the students' anxiety & enjoyment in computer courses and knowledge level in the programming courses.

3.2 The Case

The population of questionnaire were selected from in Eastern Mediterranean Doğa College in TRNC from that group of students. The target group was focused on the 5th grade primary school students who did not take any programming courses. To support the questionnaire as necessity of mixed-method research, interview questions has been involved in the research. Totally, 12 different open-ended question exits on the research. There was 41 questions in the questionnaire. The questionnaire was designed Likert Scale. The first four questions were about personal information about students and the other questions choice such as; strongly agree, agree, neutral, disagree and strongly disagree.

Before the questionnaire and interviews questions were applied, 2 hours lecture was given to students to explain the context of programming and Minecraft. The presentation was prepared for students. The teacher who directed the course explained the practice with demonstration teaching technique and applied it to the students. Basically, the programming language context and algorithm was explained to students using Minecraft in the lecture.

Student was selected relevantly in 5th grade primary school students from Eastern Mediterranean Doğa College in TRNC. There were four different group exits in the research group. The group population were approximately 63 different students. Only 31% of these students were eligible for interview questions because of strengthen data consistency of research. The students were selected to interview their teacher's perspective and personal observation of researcher's comments. As stated earlier, data were collected from the defined four different classes who were member

of these four classes. Furthermore, five different students selected each class from these courses to increase the consistency of research data's.

Table 1: Demographics information about the student's age and gender

		Frequency	Percent
Gender	Male	38	60.3
	Female	25	39.7
	Total	63	100.0
Age	10	37	58.7
	11	25	39.7
	12	1	1.6
	Total	63	100.0
Students' Duration of Computer Usage in a Day	Between 2 and 5 hours a day	15	23.8
	More than 5 hour a day	4	6.3
	A few times a week	32	50.8
	A few times a month	12	19.0
	Total	63	100.0
Students' Parents' Duration of Computer Usage in a Day	Between 2 and 5 hours a day	25	39.7
	More than 5 hour a day	13	20.6
	A few times a week	15	23.8
	A few times a month	10	15.9
	Total	63	100.0
Students Purpose of Internet During a Day	Preparing lecture notes	2	3.2
	Playing Games	39	61.9
	Doing Research	7	11.1
	Listening Music & Watching Films	8	12.7
	Social Networks (Facebook, Twitter, Instagram, Snapchat, etc.)	3	4.80

Reading News	0	0
Others	4	6.3
Total	63	100.0

As it is illustrated in Table 1, there are 63 different students in which were thirty-eight of them are male students (60.3%) and twenty-five were female students (39.7%) of the target group. However, the total number of students are represent 4 different classes. Considering each class, totally 63 students were participated in that research.

The age range of students in the midst of 10-12 in which 37 (58, 7%) of them were 10 years old, one of them (1, 6%) was 12 years old and 25 of them (39, 7%) were 11 years old. Totally, there were examined 63 different students in that research group. Moreover, Table 1 shows the duration of computer usage in a day for students and their parents and also their purpose of using internet.

According to the results, students mostly use the computer few times a week (50, 8%). Considering their answers; they are used computers more than 5 hour a day at a very low rate (6, 3%).

However, the students' parents usage of computers mostly between 2 and 5 hours a day (39.7%). Generally, the distributions usually do not show much difference but students' parents are used the computers a few times a month at a very low rate (15, 9%).

Considering the purpose of internet usage of students; it seems that there is a wide range of playing games on internet which is 61.9%. Students mostly use the internet for playing games. On the other hand, the result show that, they never use the internet to read newspapers. In addition, students are using the internet for preparing lecture notes at a very low rate (3.2%).

3.3 Data Collection and Tools

Qualitative and quantitative approaches are focused in the research to analyse the 5th grade primary school students using GBL to see their readiness for programming languages courses. Therefore, questionnaire and interview questions were prepared to collect data from students about their level and their situation in the programming language courses and their personal life's.

The used questionnaire in research was taken from Sun J. (2011); Parveen J. A., Sanweer A. & Waleed E. F. (2014) and Keramati A., Afshari-Mofrad M. & Kamrani A. (2011) articles. However, the questionnaire were translated by professional experts and teachers. Briefly, six different experts helped the translation process in order to increase reliability and validity of the questions.

At the beginning of questionnaire, personal information was collected from the participants. Moreover, demographic information was collected to get students' age range and their parents' daily computer usage were examined. Furthermore, the purpose of internet usage has been viewed by the researchers to collect data from the students.

The second part, the questions were related context of given lecture and general student's opinion about the programming language courses using GBL. There are thirty-seven questions asked for students to collect data from them.

Besides, it was desired to support the questionnaire with the results of the interviews. The interview questions was designed to student's level and context of computer courses. The contents of the interview questions are the student's perspective of games, to measure perspective of computer science courses, the times of computer usage and about Minecraft. In addition, the tendency of the students to the programming courses is also measured in these interview questions. Interview with each participant lasted for 3-7 minutes and was administrated in Turkish. The interaction between all the students and the interviewees were audio-recorded for future retrieval and analysing data well.

Chapter 4

FINDINGS AND DISCUSSIONS

This section aims to find, interpret and explain the data collected for this research.

The analysis done in this study will be conducted in accordance with the finding of answers to selected research questions for the research.

All the results given in that chapter are related to questionnaires and interview questions that are perceptions of GBL of 5th grade student's questionnaire answers.

Table 2 shows, the percentage and frequency of answers of survey questions given by students.

Table 2: Students' Understanding the concept of programming languages using GBL according to 5th grade primary school student's gender

	SA		A		N		D		SD	
	f	p	f	p	f	p	f	p	f	p
Q1.	39	61.9	20	31.7	3	4.8	0	0	1	1.6
Q2.	43	68.3	14	22.2	5	7.9	1	1.6	0	0
Q3.	41	65.1	19	30.2	1	1.6	2	3.2	0	0
Q4.	31	49.2	15	23.8	13	20.6	1	1.6	3	4.8
Q5.	28	44.4	15	23.8	15	23.8	3	4.8	2	3.2
Q6.	40	63.5	14	22.2	6	9.5	2	3.2	1	1.6
Q7.	29	46.0	15	23.8	12	19.0	5	7.9	2	3.2
Q8.	28	44.4	17	27.0	9	14.3	2	3.2	7	11.1
Q9.	48	76.2	13	20.6	0	0	1	1.6	1	1.6
Q10.	43	68.3	12	19.0	5	7.9	0	0	3	4.8
Q11.	42	66.7	11	17.5	7	11.1	1	1.6	2	3.2
Q12.	34	54.0	15	23.8	5	7.9	3	4.8	6	9.5
Q13.	41	65.1	10	15.9	8	12.7	1	1.6	3	4.8
Q14.	31	49.2	22	34.9	7	11.1	1	1.6	2	3.2

Q15.	33	52.4	21	33.3	7	11.1	1	1.6	1	1.6
Q16.	16	25.4	8	12.7	8	12.7	8	12.7	23	36.5
Q17.	33	52.4	15	23.8	6	9.5	2	3.2	7	11.1
Q18.	8	12.7	7	11.1	7	11.1	8	12.7	33	52.4
Q19.	14	22.2	6	9.5	14	22.2	9	14.3	20	31.7
Q20.	12	19.0	13	20.6	13	20.6	6	9.5	19	30.2
Q21.	12	19.0	10	15.9	8	12.7	4	6.3	29	46.0
Q22.	14	22.2	8	12.7	4	6.3	7	11.1	30	47.6
Q23.	13	20.6	7	11.1	3	4.8	4	6.3	36	57.1
Q24.	12	19.0	8	12.7	10	15.9	11	17.5	22	34.9
Q25.	13	20.6	10	15.9	8	12.7	7	11.1	25	39.7
Q26.	46	73.0	8	12.7	5	7.9	2	3.2	2	3.2
Q27.	13	20.6	10	15.9	8	12.7	7	11.1	25	39.7
Q28.	22	34.9	6	9.5	4	6.3	9	14.3	22	34.9
Q29.	49	77.8	9	14.3	3	4.8	0	0	2	3.2
Q30.	50	79.4	11	17.5	1	1.6	1	1.6	0	0
Q31.	43	68.3	15	23.8	4	6.3	0	0	1	1.6
Q32.	45	71.4	11	17.5	4	6.3	2	3.2	1	1.6
Q33.	48	76.2	12	19.0	3	4.8	0	0	0	0
Q34.	43	68.3	12	19.0	5	7.9	0	0	3	4.8
Q35.	44	69.8	12	19.0	5	7.9	0	0	2	3.2
Q36.	36	57.1	10	15.9	14	22.2	2	3.2	1	1.6
Q37.	39	61.0	12	19.0	9	14.3	3	4.8	0	0

Overall, looking at the distributions of the answers of all the questions, students were strongly agree for questions from 1 to 17 which is related about Minecraft. Unlike, students were strongly disagree for the questions from 18 to 28 that is about programming courses context. However, their answers have changed to strongly agree again for the questions from 28 to 37 which is related to again Minecraft. In addition, the students were agree for Q14 and Q15 which is related to programming courses.

On the other hand, Q.19 and 20 have very low rate for the agree answers. The other option of neutral took less point for Q.3, 9 and 30. The last option of disagree have very low rate in Q. 1, 10, 29, 31, 33, 34 and 35.

Table 3: The significant difference on understanding the concept of programming languages using GBL according to 5th grade primary school student's gender

	Gender	N	\bar{X}	S	t	p
Q1	male	38	1,32	0,53	2,19	0,032
	female	25	1,72	0,94		
Q2	male	38	1,37	0,71	0,82	0,413
	female	25	1,52	0,71		
Q3	male	38	1,37	0,67	0,85	0,397
	female	25	1,52	0,71		
Q4	male	38	1,82	1,16	0,65	0,518
	female	25	2	1		
Q5	male	38	1,95	1,11	0,33	0,743
	female	25	2,04	1,06		
Q6	male	38	1,58	1,03	0,08	0,936
	female	25	1,56	0,71		
Q7	male	38	1,97	1,17	0,09	0,929
	female	25	2	1,08		
Q8	male	38	1,74	1,13	2,81	0,007
	female	25	2,64	1,41		
Q9	male	38	1,21	0,58	1,48	0,144
	female	25	1,48	0,87		
Q10	male	38	1,42	0,86	1,17	0,248
	female	25	1,72	1,17		
Q11	male	38	1,45	0,86	1,25	0,218
	female	25	1,76	1,13		
Q12	male	38	1,68	1,09	1,81	0,075
	female	25	2,28	1,51		
Q13	male	38	1,42	0,83	2,14	0,036
	female	25	2	1,32		
Q14	male	38	1,74	0,92	0,09	0,925
	female	25	1,76	1,01		
Q15	male	38	1,61	0,95	0,69	0,49
	female	25	1,76	0,72		
Q16	male	38	3,11	1,64	0,69	0,492
	female	25	3,4	1,68		

Q17	male	38	1,84	1,28	0,93	0,358
	female	25	2,16	1,4		
Q18	male	38	3,87	1,47	0,38	0,702
	female	25	3,72	1,54		
Q19	male	38	3,34	1,55	0,66	0,514
	female	25	3,08	1,55		
Q20	male	38	3,13	1,6	0,13	0,896
	female	25	3,08	1,41		
Q21	male	38	3,63	1,6	1,12	0,266
	female	25	3,16	1,68		
Q22	male	38	3,55	1,72	0,35	0,728
	female	25	3,4	1,66		
Q23	male	38	3,63	1,76	0,29	0,771
	female	25	3,76	1,61		
Q24	male	38	3,45	1,74	0,52	0,605
	female	25	3,24	1,2		
Q25	male	38	3,5	1,74	1,01	0,317
	female	25	3,08	1,41		
Q26	male	38	1,42	1	0,85	0,399
	female	25	1,64	0,99		
Q27	male	38	2,71	1,89	1,92	0,059
	female	25	3,56	1,42		
Q28	male	38	1,42	1	0,64	0,523
	female	25	1,28	0,54		
Q29	male	38	1,18	0,46	1,21	0,232
	female	25	1,36	0,7		
Q30	male	38	1,45	0,83	0,24	0,81
	female	25	1,4	0,65		
Q31	male	38	1,39	0,86	0,73	0,469
	female	25	1,56	0,92		
Q32	male	38	1,21	0,47	1,34	0,184
	female	25	1,4	0,65		
Q33	male	38	1,37	0,82	1,71	0,093
	female	25	1,8	1,19		
Q34	male	38	1,45	0,86	0,31	0,756
	female	25	1,52	0,96		
Q35	male	38	1,76	1,73	0,79	0,431
	female	25	2,08	1,22		
Q36	male	38	2,97	1,75	0,16	0,873
	female	25	3,04	1,34		
Q37	male	38	1,61	0,97	0,15	0,883
	female	25	1,64	0,81		

An independent-group t-test was conducted to compare the gender for questionnaire questions for males and females students. There was no significant difference in scores for males questions 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 28, 30, 31, 32, 34, 35 & 37 ($\bar{X} = 127.72$ and $S = 72.16$). The magnitude of the differences between males and females for questions 1, 24, 25, 27, 29, 33 and 36 in the means ($\bar{X} = 31.04$ and $S = 15.06$). For the other questions, there was no significant differences for students. It means; the other answers did not mean anything according to t test results.

However, there are some differences when the interview answers are examined compared to questionnaire results. Considering students' answers, most of male students are spending too much time on the computer and playing games for a week. In addition, boys are playing more complex game compared to girl students. For instance, as stated by Students A&B;

I am spending time in front of computers approximately 35 hours a week which is generally for coding.

I am using the computers 21 hours a week to playing games and doing a research from internet.

To sum up, male students have a lot of computer interaction more than girls. On the other hand, the test applied on students' daily usage of computer, there was no significant differences for the other questions.

Table 4: The significant differences students' daily usage of computers affect readiness of student for programming language courses

Variance Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	173,828	111	62,988	50,61	16,231
Within Groups	3141,51	2183	53,247		
Total	3330,48	2294			

A one-way ANOVA between-groups was conducted to explore the impact of questionnaire on levels of primary school student's computer usage a day, as measured by the Scheffe Test. Participants were answered different 37 questions with four different options. (Option 1: between 2 and 5 hours a day; Option 2: more than 5 hour a day; Option 3: a few times a week and Option 4: a few times a month). There was a statistically significant difference at the $p < .05$ level in Scheffe scores for questions 1, 2, 4, 6, 9, 15, 18, 23, 26, 28, 30, 33 and 34.

Despite observing statistical significance, the actual difference in mean scores between the groups was quite small. It means; that questions are meaningful for the test that was a standard deviation of less than 0.05. For the other questions, there was no significant differences for students. The test applied on student parents' daily usage of computer, there was no significant differences for the other questions.

Nevertheless, the results that do not differ according to questionnaire, it may differ according to interview questions. For instance, the participants found the course to be quite educational and enjoyable but considering questionnaire results, students don't have same answers. For instance; students founded Minecraft as educational and instructive who spent a lot of time on the computer or less time on the computer. For example, as stated student C;

I used Minecraft and coding first time but I like too much and I worried about lesson in the beginning but I like the course when I play that games.

Generally, students enjoy the working with GBL tools in course and they are believing to achieve computer courses using GBL tools.

Moreover, As stated Wu, Chang, and He (2010) that; researchers design a class to measure students anxiety and success on the computer programming classes using GBL. Totally, 19 questions asked the students in order to analyse student's enjoyment, playfulness and anxiety. However, it has been observed that the students have been working more successfully with the GBL tool Scratch.

Table 5: Students family's (mother, father, & brothers) daily usage of computers affect readiness of student for programming language courses

Variance Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	145,347	111	50,956	35,105	19,369
Within Groups	3177,6	2183	53,858		
Total	3330,48	2294			

In this table 5; a one-way between-groups analysis of variance was conducted to explore the impact of questionnaire on levels of primary school student's family's computer usage a day, as measured by the Scheffe Test. Participants were answered different 37 question with four different options. (Option 1: between 2 and 5 hours a day; Option 2: more than 5 hour a day; Option 3: a few times a week and Option 4: a few times a month). There was a statistically significant difference at the $p < .05$ level in Scheffe scores for questions 3, 5, 6, 7, 8, 9, 18, 26, 32, 33 and 35.

Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. It means; that questions are meaningful for the test that was a standard deviation of less than 0.05. For the other questions, there was no significant differences for students. The test applied on students' daily usage of computer, there was no significant differences for the other questions.

On the other hand, even students parents' who did not spend time in the computer equally, students could understand the basic principles of programming language courses and algorithm using GBL according to results of interview questions answers. Although the participants prefer to play different games, it turns out that the game used in the event is enjoyable for them. Computer rates used by family members on a daily basis or the constraints on the participants did not show any differences according to interview questions results. For instance; as mentioned student D;

I used computers more than ten hours a day and I used the computer mostly play a game.

Even students family's used the computers for different purpose, students can spend a lot of time in front of computers.

However in the literature, Chen and Cheng (2007) research mentioned that; while programming a game is difficult even for a professional programmer, the students program their own games in this research. Almost each students had not good experiences about the programming. As a result of the research, it was observed that the students became better and more motivated.

Table 6: Purpose of using the Internet effect the readiness of students for programming language courses

Variance Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	195,977	185	43,761	34,801	20,434
Within Groups	3111,68	2109	54,594		
Total	3330,48	2294			

A one-way between-groups analysis of variance was conducted to explore the impact of questionnaire on levels of primary school student's purpose of internet, as measured by the Scheffe Test. Participants were answered different 37 question with 7 different options. (Option 1: Studying; Option 2: Playing a game; Option 3: Doing a research; Option 4: Listening to music or watching a movie; Option 5: Social Networks (Facebook, Twitter, Instagram, Snapchat, etc.); Option 6: Reading News and Option 7: Others). There was a statistically significant difference at the $p < .05$ level in Scheffe scores for questions 1, 3, 7, 9, 11, 13, 17, 23, 27, 29, 31, 34 and 37.

Despite observing statistical significance, the actual difference in mean scores between the groups was quite small. It means; that questions are meaningful for the test that was a standard deviation of less than 0.05. For the other questions, there was no significant differences for students. The test applied on students' purpose of internet, there was no significant differences for the other questions.

Alternatively, even students are spending time different purpose on the internet, they stated that to understand the programming logic through the activity. Even some

students (most of them girls) who used the computers only prepare a lesson or doing research, they are enjoyed activity using GBL in computer courses.

For instance; as stated by student E;

I used the computers prepare a project or watching a movie but I am thinking the Minecraft is very enjoyable and attractive for me.

Furthermore; as mentioned by student F:

I am spending time to watching a videos from YouTube on the computer, I did not play a game mostly on the computer but Minecraft impressed me because of realistic and style itself.

To sum up, participants used the computer for the different purpose but GBL seems to have changed something about computer courses.

According to literature research done by Du, Wimmer, and Rada (2016); Angry Birds was selected to see student's attitude in programming languages and at the end of the game evaluation was made according to the collected survey results. Angry Birds which is a tool in Hour of Code website, it support GBL context and this website have lots of games to teach students in programming languages. The results indicated, Hour of Code has a positive impact on the student's attitude and it provide advantages for teachers too much.

Chapter 5

CONCLUSION

The research focused 5th grade primary school students on understanding the concept of programming languages through GBL. Research has focused on this issue and investigated why students do not have a high success rate in computer science at primary school. In addition, research aim to see the readiness of students about programming language courses. The main aim doing this research was to make students better about programming and computer courses in their future educational life.

According to the study, the main problem, programming education is starting the high schools level but it can be too late for students improving. Especially, starting in the late years of programming courses education, it can make difficult for students to learn to programming. It may be an accurate viewpoint that programming education should start early stage to increase students' achievement and abilities to become better. The study focused 5th grade primary school students using GBL. Minecraft help the study to investigate real problem of programming courses. These application can reach from Code.org website.

The study was applied with Eastern Mediterranean Doğa College students. There were four different classes selected for study and collect data from there. The investigators lectured at a total of four different classes in two lecture times per class

and then applied a questionnaire to collect data from the students. Furthermore, the interview questions were applied same group of students.

According to the t-test results, gender shows seven different questions shows diversity in the questionnaire when looking at the total number of questions. Based on these results, gender effect the students' knowledge level in the computer science courses. It means; students like the game that name is Minecraft and they are worried about the computer lessons generally. In fact, students support this trail with the given answers of questionnaire. For instance; students founded Minecraft as educational and instructive who spent a lot of time on the computer or less time on the computer. In addition; interview answers support that result of t-test.

ANOVA results are quite same to t test results. The students were answered exactly same question for three different ANOVA test that was questions 9. Considering the results, students liked to learn programming with play a game more importantly. Moreover, some questions can be focused in order to ANOVA test results. For instance; questions 3, 6, 7, 9, 18, 23, 26, 33 and 34.

The questions were presented according to the common answers in the ANOVA test. It can be said that Minecraft is really different from the study by going out from given answers. The students enjoyed when they were doing exercises in the courses. Considering personal observation, students liked the GBL and students can start the programming language courses in primary school ages.

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APPENDICES

Appendix A: Questionnaire

Phase 1: Questionnaire

The purpose of this questionnaire is to collect the information about readiness of 5th grade students in primary school to understanding of programming language using GBL. We would be very grateful if you could complete this questionnaire by ticking the boxes corresponding to your answer or entering an appropriate response when indicated. Your participation is entirely voluntary and although completing this questionnaire will not benefit you directly, it may impact on the future using Minecraft in programming language courses.

1. Gender: Male: Female:

2. Age:

3. What is the approximate duration of your computer usage a day?
 - () Between 2 and 5 hours a day
 - () More than 5 hour a day
 - () A few times a week
 - () A few times a month

4. What is the approximate duration of your parents' computer usage a day?
 - () Between 2 and 5 hours a day
 - () More than 5 hour a day
 - () A few times a week
 - () A few times a month

5. What is your purpose on using the Internet?
 - () Preparing lecture notes
 - () Playing Games
 - () Doing Research
 - () Listening Music & Watching Films
 - () Social Networks (Facebook, Twitter, Instagram, Snapchat, etc.)
 - () Reading News
 - () Others

	SA	A	N	D	SD
1. When programing with Minecraft I learn more					
2. With Minecraft I learn better how to program					
3. Minecraft helps me understand programming					
4. I learn more quickly when working with Minecraft					
5. It is easy to work with Minecraft					
6. Minecraft is easy to use					
7. It is easy to program the Minecraft board					
8. Lab sessions with Minecraft are more entertaining					
9. I have fun working with Minecraft					
10. Working with Minecraft is more enjoyable					
11. I enjoy doing programming language					
12. Minecraft word problems fascinate me.					
13. I always look forward to a programming language class.					
14. Programming language course is very interesting to me.					
15. I enjoyed watching a teacher work on a programming language problem on the board.					
16. I think of other things when a computer teacher is talking or working on a problem.					
17. I also like to do and think about computer courses outside of school.					
18. Programming language is boring.					
19. My mind goes blank when I see a programming language test.					
20. I feel uneasy when I see coding problems.					

21. I feel nervous when a computer teacher asks me questions in class.					
22. I feel insecure about asking computer questions in class.					
23. I get nervous or frightened watching a teacher work on a programming language problem on the board.					
24. When I take a computer test, I worry that I will get a bad grade.					
25. I worry a lot before a computer test.					
26. I feel at ease using the Minecraft					
27. I think the Minecraft is too demanding for me					
28. I will try this Minecraft game and work it out					
29. I am happy with the result obtained with the Minecraft					
30. I believe Minecraft provides a solution to the problem					
31. I am receptive to the outcome of the Minecraft					
32. I like the way how the Minecraft is supposed to be used					
33. The rules associated with the Minecraft seem reasonable					
34. I am inclined to follow the rules in using the Minecraft					
35. It is mostly up to me whether or not I get the job done					
36. There is very little I can do to obtain what I want					
37. I have complete control over the process					

Appendix B: Interview Questions

1. Evinde bilgisayarın var mı?
2. Bilgisayarı nerelerde kullanabiliyorsun?
3. Bilgisayarı haftada ne kadar süre ve hangi amaçlarla kullanıyorsun?
4. Bilgisayarda oyun oynuyor musun?
5. Hangi oyunları oynamayı daha çok tercih ediyorsun?
6. Haftada bilgisayar oyunu oynamaya ne kadar vakit harcıyorsun?
7. Daha önce herhangi bir programlama dili kullandın mı? Programlama dili hakkında neler düşünüyorsun?
8. Minecraft hakkında düşüncelerin nelerdir?
9. Minecraft ile programlama dili öğrenmesi nasıldı?
10. Etkinliği eğlenceli ve öğretici buldun mu?
11. Programlama dilini Minecraft'a benzer oyunlarla öğrenmeyi tercih eder misin? Neden?
12. Son olarak söylemek istediğin bir şey var mı?

Appendix C: Descriptive Statics of Given Answers for Questionnaire

		Frequency	Percent
Gender	Male	38	60.3
	Female	25	39.7
	Total	63	100.0
Age	10	37	58.7
	11	25	39.7
	12	1	1.6
	Total	63	100.0
Students Duration of Computer Usage During a Day	Between 2 and 5 hours a day	15	23.8
	More than 5 hour a day	4	6.3
	A few times a week	32	50.8
	A few times a month	12	19.0
	Total	63	100.0
Students Parents' Duration of Computer Usage a Day	Between 2 and 5 hours a day	25	39.7
	More than 5 hour a day	13	20.6
	A few times a week	15	23.8
	A few times a month	10	15.9
	Total	63	100.0
Students Purpose of Internet During a Day	Preparing lecture notes	2	3.2
	Playing Games	39	61.9
	Doing Research	7	11.1
	Listening Music & Watching Films	8	12.7
	Social Networks (Facebook, Twitter, Instagram, Snapchat, etc.)	3	4.8
	Reading News	0	0
	Others	4	6.3
	Total	63	100.0

Appendix D: Descriptive Statics Questions in Questionnaire

	SA		A		N		D		SD	
	f	p	f	p	f	p	f	p	f	p
Q1.	39	61.9	20	31.7	3	4.8	0	0	1	1.6
Q2.	43	68.3	14	22.2	5	7.9	1	1.6	0	0
Q3.	41	65.1	19	30.2	1	1.6	2	3.2	0	0
Q4.	31	49.2	15	23.8	13	20.6	1	1.6	3	4.8
Q5.	28	44.4	15	23.8	15	23.8	3	4.8	2	3.2
Q6.	40	63.5	14	22.2	6	9.5	2	3.2	1	1.6
Q7.	29	46.0	15	23.8	12	19.0	5	7.9	2	3.2
Q8.	28	44.4	17	27.0	9	14.3	2	3.2	7	11.1
Q9.	48	76.2	13	20.6	0	0	1	1.6	1	1.6
Q10.	43	68.3	12	19.0	5	7.9	0	0	3	4.8
Q11.	42	66.7	11	17.5	7	11.1	1	1.6	2	3.2
Q12.	34	54.0	15	23.8	5	7.9	3	4.8	6	9.5
Q13.	41	65.1	10	15.9	8	12.7	1	1.6	3	4.8
Q14.	31	49.2	22	34.9	7	11.1	1	1.6	2	3.2
Q15.	33	52.4	21	33.3	7	11.1	1	1.6	1	1.6
Q16.	16	25.4	8	12.7	8	12.7	8	12.7	23	36.5
Q17.	33	52.4	15	23.8	6	9.5	2	3.2	7	11.1
Q18.	8	12.7	7	11.1	7	11.1	8	12.7	33	52.4
Q19.	14	22.2	6	9.5	14	22.2	9	14.3	20	31.7
Q20.	12	19.0	13	20.6	13	20.6	6	9.5	19	30.2
Q21.	12	19.0	10	15.9	8	12.7	4	6.3	29	46.0
Q22.	14	22.2	8	12.7	4	6.3	7	11.1	30	47.6
Q23.	13	20.6	7	11.1	3	4.8	4	6.3	36	57.1
Q24.	12	19.0	8	12.7	10	15.9	11	17.5	22	34.9
Q25.	13	20.6	10	15.9	8	12.7	7	11.1	25	39.7
Q26.	46	73.0	8	12.7	5	7.9	2	3.2	2	3.2
Q27.	13	20.6	10	15.9	8	12.7	7	11.1	25	39.7
Q28.	22	34.9	6	9.5	4	6.3	9	14.3	22	34.9
Q29.	49	77.8	9	14.3	3	4.8	0	0	2	3.2
Q30.	50	79.4	11	17.5	1	1.6	1	1.6	0	0
Q31.	43	68.3	15	23.8	4	6.3	0	0	1	1.6
Q32.	45	71.4	11	17.5	4	6.3	2	3.2	1	1.6
Q33.	48	76.2	12	19.0	3	4.8	0	0	0	0
Q34.	43	68.3	12	19.0	5	7.9	0	0	3	4.8
Q35.	44	69.8	12	19.0	5	7.9	0	0	2	3.2

Q36.	36	57.1	10	15.9	14	22.2	2	3.2	1	1.6
Q37.	39	61.0	12	19.0	9	14.3	3	4.8	0	0

Appendix E: Independent t-test Result of Questionnaire

Group Statistics					
	gender	N	Mean	Std. Deviation	Std. Error Mean
When programing with Minecraft I learn more	male	38	1,3158	,52532	,08522
	female	25	1,7200	,93630	,18726
With Minecraft I learn better how to program	male	38	1,3684	,71361	,11576
	female	25	1,5200	,71414	,14283
Minecraft helps me understand programming	male	38	1,3684	,67468	,10945
	female	25	1,5200	,71414	,14283
I learn more quickly when working with Minecraft	male	38	1,8158	1,15911	,18803
	female	25	2,0000	1,00000	,20000
It is easy to work with Minecraft	male	38	1,9474	1,11373	,18067
	female	25	2,0400	1,05987	,21197
Minecraft is easy to use	male	38	1,5789	1,03013	,16711
	female	25	1,5600	,71181	,14236
It is easy to program the Minecraft board	male	38	1,9737	1,17374	,19041
	female	25	2,0000	1,08012	,21602
Lab sessions with Minecraft are more entertaining	male	38	1,7368	1,13147	,18355
	female	25	2,6400	1,41067	,28213
I have fun working with Minecraft	male	38	1,2105	,57694	,09359
	female	25	1,4800	,87178	,17436
Working with Minecraft is more enjoyable	male	38	1,4211	,85840	,13925
	female	25	1,7200	1,17331	,23466
I enjoy doing programming language	male	38	1,4474	,86046	,13959
	female	25	1,7600	1,12842	,22568
Minecraft word problems fascinate me.	male	38	1,6842	1,09311	,17733
	female	25	2,2800	1,51438	,30288
I always look forward to a programming language class.	male	38	1,4211	,82631	,13405
	female	25	2,0000	1,32288	,26458
Programming language course is very interesting to me.	male	38	1,7368	,92076	,14937
	female	25	1,7600	1,01160	,20232
I enjoyed watching a teacher work on a programming language problem on the board.	male	38	1,6053	,94553	,15339
	female	25	1,7600	,72342	,14468
I think of other things when a computer teacher is talking or working on a problem.	male	38	3,1053	1,64053	,26613
	female	25	3,4000	1,68325	,33665

I also like to do and think about computer courses outside of school.	male	38	1,8421	1,28455	,20838
	female	25	2,1600	1,40475	,28095
Programming language is boring.	male	38	3,8684	1,47357	,23904
	female	25	3,7200	1,54164	,30833
My mind goes blank when I see a programming language test.	male	38	3,3421	1,54703	,25096
	female	25	3,0800	1,55242	,31048
I feel uneasy when I see coding problems.	male	38	3,1316	1,59681	,25904
	female	25	3,0800	1,41185	,28237
I feel nervous when a computer teacher asks me questions in class.	male	38	3,6316	1,60103	,25972
	female	25	3,1600	1,67531	,33506
I feel insecure about asking computer questions in class.	male	38	3,5526	1,71948	,27894
	female	25	3,4000	1,65831	,33166
I get nervous or frightened watching a teacher work on a programming language problem on the board.	male	38	3,6316	1,76177	,28580
	female	25	3,7600	1,61452	,32290
When I take a computer test, I worry that I will get a bad grade.	male	38	3,4474	1,73513	,28147
	female	25	3,2400	1,20000	,24000
I worry a lot before a computer test.	male	38	3,5000	1,73595	,28161
	female	25	3,0800	1,41185	,28237
I feel at ease using the Minecraft	male	38	1,4211	1,00355	,16280
	female	25	1,6400	,99499	,19900
I think the Minecraft is too demanding for me	male	38	2,7105	1,88748	,30619
	female	25	3,5600	1,41657	,28331
I will try this Minecraft game and work it out	male	38	1,4211	1,00355	,16280
	female	25	1,2800	,54160	,10832
I am happy with the result obtained with the Minecraft	male	38	1,1842	,45650	,07405
	female	25	1,3600	,70000	,14000
I believe Minecraft provides a solution to the problem	male	38	1,4474	,82846	,13439
	female	25	1,4000	,64550	,12910
I am receptive to the outcome of the Minecraft	male	38	1,3947	,85549	,13878
	female	25	1,5600	,91652	,18330
I like the way how the Minecraft is supposed to be used	male	38	1,2105	,47408	,07691
	female	25	1,4000	,64550	,12910
The rules associated with the Minecraft seem reasonable	male	38	1,3684	,81940	,13292
	female	25	1,8000	1,19024	,23805
I am inclined to follow the	male	38	1,4474	,86046	,13959

rules in using the Minecraft	female	25	1,5200	,96264	,19253
It is mostly up to me whether or not I get the job done	male	38	1,7632	1,73102	,28081
	female	25	2,0800	1,22202	,24440
There is very little I can do to obtain what I want	male	38	2,9737	1,74738	,28346
	female	25	3,0400	1,33791	,26758
I have complete control over the process	male	38	1,6053	,97369	,15795
	female	25	1,6400	,81035	,16207

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
When programing with Minecraft I learn more	Equal variances assumed	4,639	,035	-2,193	61	,032	-,40421
	Equal variances not assumed			-1,965	34,023	,058	-,40421
With Minecraft I learn better how to program	Equal variances assumed	,596	,443	-,825	61	,413	-,15158
	Equal variances not assumed			-,824	51,479	,413	-,15158
Minecraft helps me understand programming	Equal variances assumed	,313	,578	-,852	61	,397	-,15158
	Equal variances not assumed			-,842	49,410	,404	-,15158
I learn more quickly when working with Minecraft	Equal variances assumed	1,729	,194	-,651	61	,518	-,18421
	Equal variances not assumed			-,671	56,530	,505	-,18421
It is easy to work with	Equal variances	1,122	,294	-,329	61	,743	-,09263

Minecraft	assumed						
	Equal variances not assumed			-,333	53,293	,741	-,09263
Minecraft is easy to use	Equal variances assumed	1,413	,239	,080	61	,936	,01895
	Equal variances not assumed			,086	60,813	,932	,01895
It is easy to program the Minecraft board	Equal variances assumed	1,030	,314	-,090	61	,929	-,02632
	Equal variances not assumed			-,091	54,456	,928	-,02632
Lab sessions with Minecraft are more entertaining	Equal variances assumed	2,276	,137	-2,808	61	,007	-,90316
	Equal variances not assumed			-2,683	43,554	,010	-,90316
I have fun working with Minecraft	Equal variances assumed	3,800	,056	-1,479	61	,144	-,26947
	Equal variances not assumed			-1,362	37,788	,181	-,26947
Working with Minecraft is more enjoyable	Equal variances assumed	2,019	,160	-1,168	61	,248	-,29895
	Equal variances not assumed			-1,096	40,612	,280	-,29895
I enjoy doing programming language	Equal variances assumed	,432	,513	-1,246	61	,218	-,31263
	Equal variances not assumed			-1,178	41,897	,245	-,31263
Minecraft word problems	Equal variances	3,047	,086	-1,814	61	,075	-,59579

fascinate me.	assumed						
	Equal variances not assumed			-1,698	40,209	,097	-,59579
I always look forward to a programming language class.	Equal variances assumed	3,247	,076	-2,141	61	,036	-,57895
	Equal variances not assumed			-1,952	36,349	,059	-,57895
Programming language course is very interesting to me.	Equal variances assumed	,360	,551	-,094	61	,925	-,02316
	Equal variances not assumed			-,092	48,036	,927	-,02316
I enjoyed watching a teacher work on a programming language problem on the board.	Equal variances assumed	,894	,348	-,695	61	,490	-,15474
	Equal variances not assumed			-,734	59,507	,466	-,15474
I think of other things when a computer teacher is talking or working on a problem.	Equal variances assumed	,449	,505	-,691	61	,492	-,29474
	Equal variances not assumed			-,687	50,561	,495	-,29474
I also like to do and think about computer courses outside of school.	Equal variances assumed	,012	,911	-,926	61	,358	-,31789
	Equal variances not assumed			-,909	48,206	,368	-,31789
Programming language is boring.	Equal variances assumed	,143	,707	,384	61	,702	,14842
	Equal variances not assumed			,380	49,842	,705	,14842

My mind goes blank when I see a programming language test.	Equal variances assumed	,054	,816	,657	61	,514	,26211
	Equal variances not assumed			,657	51,379	,514	,26211
I feel uneasy when I see coding problems.	Equal variances assumed	2,285	,136	,131	61	,896	,05158
	Equal variances not assumed			,135	55,771	,893	,05158
I feel nervous when a computer teacher asks me questions in class.	Equal variances assumed	,177	,675	1,123	61	,266	,47158
	Equal variances not assumed			1,112	49,835	,271	,47158
I feel insecure about asking computer questions in class.	Equal variances assumed	,133	,716	,350	61	,728	,15263
	Equal variances not assumed			,352	52,818	,726	,15263
I get nervous or frightened watching a teacher work on a programming language problem on the board.	Equal variances assumed	1,342	,251	-,292	61	,771	-,12842
	Equal variances not assumed			-,298	54,597	,767	-,12842
When I take a computer test, I worry that I will get a bad grade.	Equal variances assumed	15,854	,000	,521	61	,605	,20737
	Equal variances not assumed			,561	60,807	,577	,20737
I worry a lot before a computer test.	Equal variances assumed	5,797	,019	1,009	61	,317	,42000
	Equal variances not			1,053	58,162	,297	,42000

	assumed						
I feel at ease using the Minecraft	Equal variances assumed	,799	,375	-,850	61	,399	-,21895
	Equal variances not assumed			-,852	51,819	,398	-,21895
I think the Minecraft is too demanding for me	Equal variances assumed	13,753	,000	-1,920	61	,059	-,84947
	Equal variances not assumed			-2,036	59,847	,046	-,84947
I will try this Minecraft game and work it out	Equal variances assumed	2,291	,135	,643	61	,523	,14105
	Equal variances not assumed			,721	59,142	,474	,14105
I am happy with the result obtained with the Minecraft	Equal variances assumed	4,382	,040	-1,208	61	,232	-,17579
	Equal variances not assumed			-1,110	37,409	,274	-,17579
I believe Minecraft provides a solution to the problem	Equal variances assumed	,311	,579	,241	61	,810	,04737
	Equal variances not assumed			,254	59,147	,800	,04737
I am receptive to the outcome of the Minecraft	Equal variances assumed	,583	,448	-,729	61	,469	-,16526
	Equal variances not assumed			-,719	48,964	,476	-,16526
I like the way how the Minecraft is supposed to be used	Equal variances assumed	5,748	,020	-1,343	61	,184	-,18947
	Equal variances not assumed			-1,261	40,729	,215	-,18947

	assumed						
The rules associated with the Minecraft seem reasonable	Equal variances assumed	3,828	,055	-1,706	61	,093	-,43158
	Equal variances not assumed			-1,583	38,850	,122	-,43158
I am inclined to follow the rules in using the Minecraft	Equal variances assumed	,216	,644	-,313	61	,756	-,07263
	Equal variances not assumed			-,305	47,372	,761	-,07263
It is mostly up to me whether or not I get the job done	Equal variances assumed	,005	,943	-,793	61	,431	-,31684
	Equal variances not assumed			-,851	60,641	,398	-,31684
There is very little I can do to obtain what I want	Equal variances assumed	7,034	,010	-,161	61	,873	-,06632
	Equal variances not assumed			-,170	59,493	,865	-,06632
I have complete control over the process	Equal variances assumed	,420	,520	-,148	61	,883	-,03474
	Equal variances not assumed			-,153	57,560	,879	-,03474

Appendix F: Anova Test Result in Questionnaire

		N	Mean	Std. Deviation
When programing with Minecraft I learn more	between 2 and 5 hours a day	15	1,2000	,56061
	more than 5 hour a day	4	1,5000	,57735
	a few times a week	32	1,4688	,56707
	a few times a month	12	1,8333	1,19342
	Total	63	1,4762	,73741
With Minecraft I learn better how to program	between 2 and 5 hours a day	15	1,1333	,35187
	more than 5 hour a day	4	2,2500	1,50000
	a few times a week	32	1,5313	,67127
	a few times a month	12	1,2500	,62158
	Total	63	1,4286	,71198
Minecraft helps me understand programming	between 2 and 5 hours a day	15	1,2667	,79881
	more than 5 hour a day	4	1,5000	1,00000
	a few times a week	32	1,4688	,50701
	a few times a month	12	1,5000	,90453
	Total	63	1,4286	,68895
I learn more quickly when working with Minecraft	between 2 and 5 hours a day	15	1,2667	,59362
	more than 5 hour a day	4	2,5000	1,91485
	a few times a week	32	1,9063	,85607
	a few times a month	12	2,4167	1,50504
	Total	63	1,8889	1,09414
It is easy to work with Minecraft	between 2 and 5 hours a day	15	1,7333	1,09978
	more than 5 hour a day	4	1,2500	,50000
	a few times a week	32	1,9375	,91361
	a few times a month	12	2,6667	1,37069
	Total	63	1,9841	1,08497

Minecraft is easy to use	between 2 and 5 hours a day	15	1,2000	,56061
	more than 5 hour a day	4	1,0000	,00000
	a few times a week	32	1,6563	,82733
	a few times a month	12	2,0000	1,34840
	Total	63	1,5714	,91077
It is easy to program the Minecraft board	between 2 and 5 hours a day	15	2,2000	1,37321
	more than 5 hour a day	4	1,5000	1,00000
	a few times a week	32	1,9063	,96250
	a few times a month	12	2,0833	1,31137
	Total	63	1,9841	1,12869
Lab sessions with Minecraft are more entertaining	between 2 and 5 hours a day	15	1,5333	1,12546
	more than 5 hour a day	4	3,0000	1,63299
	a few times a week	32	2,0938	1,22762
	a few times a month	12	2,5000	1,50756
	Total	63	2,0952	1,31633
I have fun working with Minecraft	between 2 and 5 hours a day	15	1,2667	,45774
	more than 5 hour a day	4	2,0000	1,41421
	a few times a week	32	1,1875	,39656
	a few times a month	12	1,5000	1,16775
	Total	63	1,3175	,71449
Working with Minecraft is more enjoyable	between 2 and 5 hours a day	15	1,5333	1,12546
	more than 5 hour a day	4	1,7500	,95743
	a few times a week	32	1,4688	,87931
	a few times a month	12	1,6667	1,23091
	Total	63	1,5397	,99718
I enjoy doing programming language	between 2 and 5 hours a day	15	1,5333	,83381
	more than 5 hour a day	4	1,5000	1,00000
	a few times a week	32	1,5313	,94985
	a few times a month	12	1,7500	1,28806

	Total	63	1,5714	,97904
Minecraft word problems fascinate me.	between 2 and 5 hours a day	15	1,6667	1,11270
	more than 5 hour a day	4	2,2500	,95743
	a few times a week	32	1,8750	1,33803
	a few times a month	12	2,2500	1,54479
	Total	63	1,9206	1,29890
I always look forward to a programming language class.	between 2 and 5 hours a day	15	1,4667	1,12546
	more than 5 hour a day	4	1,7500	1,50000
	a few times a week	32	1,6250	,94186
	a few times a month	12	1,9167	1,31137
	Total	63	1,6508	1,08000
Programming language course is very interesting to me.	between 2 and 5 hours a day	15	1,6667	,97590
	more than 5 hour a day	4	1,5000	,57735
	a few times a week	32	1,6875	,89578
	a few times a month	12	2,0833	1,16450
	Total	63	1,7460	,94984
I enjoyed watching a teacher work on a programming language problem on the board.	between 2 and 5 hours a day	15	1,8000	1,32017
	more than 5 hour a day	4	1,5000	,57735
	a few times a week	32	1,6250	,65991
	a few times a month	12	1,6667	,77850
	Total	63	1,6667	,86136
I think of other things when a computer teacher is talking or working on a problem.	between 2 and 5 hours a day	15	2,8000	1,74028
	more than 5 hour a day	4	3,7500	,95743
	a few times a week	32	3,0313	1,63597
	a few times a month	12	4,0833	1,56428
	Total	63	3,2222	1,65046
I also like to do and think about computer courses outside of school.	between 2 and 5 hours a day	15	1,4667	,91548
	more than 5 hour a day	4	2,5000	1,91485
	a few times a week	32	1,9375	1,31830
	a few times a	12	2,5000	1,50756

	month			
	Total	63	1,9683	1,33160
Programming language is boring.	between 2 and 5 hours a day	15	4,2000	1,32017
	more than 5 hour a day	4	5,0000	,00000
	a few times a week	32	3,6875	1,55413
	a few times a month	12	3,2500	1,54479
	Total	63	3,8095	1,49037
My mind goes blank when I see a programming language test.	between 2 and 5 hours a day	15	3,3333	1,71825
	more than 5 hour a day	4	4,2500	,95743
	a few times a week	32	3,0313	1,55510
	a few times a month	12	3,3333	1,43548
	Total	63	3,2381	1,54204
I feel uneasy when I see coding problems.	between 2 and 5 hours a day	15	3,5333	1,64172
	more than 5 hour a day	4	4,5000	1,00000
	a few times a week	32	2,8125	1,44663
	a few times a month	12	2,9167	1,44338
	Total	63	3,1111	1,51456
I feel nervous when a computer teacher asks me questions in class.	between 2 and 5 hours a day	15	3,6000	1,63881
	more than 5 hour a day	4	4,5000	1,00000
	a few times a week	32	3,2188	1,67975
	a few times a month	12	3,5000	1,67874
	Total	63	3,4444	1,63409
I feel insecure about asking computer questions in class.	between 2 and 5 hours a day	15	3,8000	1,65616
	more than 5 hour a day	4	4,2500	1,50000
	a few times a week	32	3,1250	1,66074
	a few times a month	12	3,8333	1,80067
	Total	63	3,4921	1,68363
I get nervous or frightened watching a teacher work on a programming language problem on the board.	between 2 and 5 hours a day	15	3,6667	1,83874
	more than 5 hour a day	4	5,0000	,00000
	a few times a week	32	3,4688	1,66529

	a few times a month	12	3,8333	1,80067
	Total	63	3,6825	1,69273
When I take a computer test, I worry that I will get a bad grade.	between 2 and 5 hours a day	15	3,6000	1,45406
	more than 5 hour a day	4	4,0000	2,00000
	a few times a week	32	3,1875	1,49056
	a few times a month	12	3,3333	1,72328
	Total	63	3,3651	1,53771
I worry a lot before a computer test.	between 2 and 5 hours a day	15	3,6000	1,50238
	more than 5 hour a day	4	4,0000	2,00000
	a few times a week	32	3,0000	1,58623
	a few times a month	12	3,6667	1,72328
	Total	63	3,3333	1,61645
I feel at ease using the Minecraft	between 2 and 5 hours a day	15	1,1333	,51640
	more than 5 hour a day	4	1,2500	,50000
	a few times a week	32	1,7188	1,17045
	a few times a month	12	1,5000	1,00000
	Total	63	1,5079	,99795
I think the Minecraft is too demanding for me	between 2 and 5 hours a day	15	3,5333	1,80739
	more than 5 hour a day	4	3,0000	2,30940
	a few times a week	32	2,9063	1,67254
	a few times a month	12	2,8333	1,85047
	Total	63	3,0476	1,75452
I will try this Minecraft game and work it out	between 2 and 5 hours a day	15	1,0667	,25820
	more than 5 hour a day	4	1,0000	,00000
	a few times a week	32	1,4688	,87931
	a few times a month	12	1,5833	1,24011
	Total	63	1,3651	,84818
I am happy with the result obtained with the Minecraft	between 2 and 5 hours a day	15	1,1333	,35187
	more than 5 hour a day	4	1,5000	1,00000

	a few times a week	32	1,2813	,45680
	a few times a month	12	1,2500	,86603
	Total	63	1,2540	,56706
I believe Minecraft provides a solution to the problem	between 2 and 5 hours a day	15	1,0667	,25820
	more than 5 hour a day	4	2,7500	1,70783
	a few times a week	32	1,3438	,54532
	a few times a month	12	1,6667	,77850
	Total	63	1,4286	,75593
I am receptive to the outcome of the Minecraft	between 2 and 5 hours a day	15	1,4667	,99043
	more than 5 hour a day	4	1,7500	,95743
	a few times a week	32	1,3750	,79312
	a few times a month	12	1,5833	,99620
	Total	63	1,4603	,87668
I like the way how the Minecraft is supposed to be used	between 2 and 5 hours a day	15	1,3333	,72375
	more than 5 hour a day	4	1,5000	1,00000
	a few times a week	32	1,2500	,43994
	a few times a month	12	1,2500	,45227
	Total	63	1,2857	,55150
The rules associated with the Minecraft seem reasonable	between 2 and 5 hours a day	15	1,2667	,59362
	more than 5 hour a day	4	1,0000	,00000
	a few times a week	32	1,5938	1,07341
	a few times a month	12	1,9167	1,24011
	Total	63	1,5397	,99718
I am inclined to follow the rules in using the Minecraft	between 2 and 5 hours a day	15	1,1333	,35187
	more than 5 hour a day	4	2,5000	1,91485
	a few times a week	32	1,5000	,91581
	a few times a month	12	1,5000	,67420
	Total	63	1,4762	,89546
It is mostly up to me whether or not I get the job done	between 2 and 5 hours a day	15	1,4000	,73679
	more than 5 hour a	4	1,5000	1,00000

	day			
	a few times a week	32	2,2188	1,96312
	a few times a month	12	1,7500	,96531
	Total	63	1,8889	1,54618
There is very little I can do to obtain what I want	between 2 and 5 hours a day	15	3,2667	1,62422
	more than 5 hour a day	4	3,5000	1,91485
	a few times a week	32	2,9063	1,57315
	a few times a month	12	2,7500	1,60255
	Total	63	3,0000	1,58623
I have complete control over the process	between 2 and 5 hours a day	15	1,6000	,98561
	more than 5 hour a day	4	1,7500	1,50000
	a few times a week	32	1,6563	,86544
	a few times a month	12	1,5000	,79772
	Total	63	1,6190	,90569

		Sum of Squares	df	Mean Square	F	Sig.	Differences
When programing with Minecraft I learn more	Between Groups	2,679	3	,893	1,698	,177	
	Within Groups	31,035	59	,526			
	Total	33,714	62				
With Minecraft I learn better how to program	Between Groups	4,726	3	1,575	3,481	,021	
	Within Groups	26,702	59	,453			
	Total	31,429	62				
Minecraft helps me understand programming	Between Groups	,526	3	,175	,358	,783	
	Within Groups	28,902	59	,490			
	Total	29,429	62				
I learn more quickly when working with Minecraft	Between Groups	10,653	3	3,551	3,296	,027	
	Within Groups	63,569	59	1,077			
	Total	74,222	62				

It is easy to work with Minecraft	Between Groups	8,759	3	2,920	2,682	,055	
	Within Groups	64,225	59	1,089			
	Total	72,984	62				
Minecraft is easy to use	Between Groups	5,810	3	1,937	2,505	,068	
	Within Groups	45,619	59	,773			
	Total	51,429	62				
It is easy to program the Minecraft board	Between Groups	1,949	3	,650	,497	,685	
	Within Groups	77,035	59	1,306			
	Total	78,984	62				
Lab sessions with Minecraft are more entertaining	Between Groups	9,976	3	3,325	2,013	,122	
	Within Groups	97,452	59	1,652			
	Total	107,429	62				
I have fun working with Minecraft	Between Groups	2,842	3	,947	1,940	,133	
	Within Groups	28,808	59	,488			
	Total	31,651	62				
Working with Minecraft is more enjoyable	Between Groups	,532	3	,177	,171	,915	
	Within Groups	61,119	59	1,036			
	Total	61,651	62				
I enjoy doing programming language	Between Groups	,476	3	,159	,159	,923	
	Within Groups	58,952	59	,999			
	Total	59,429	62				
Minecraft word problems fascinate me.	Between Groups	2,770	3	,923	,535	,660	
	Within Groups	101,833	59	1,726			
	Total	104,603	62				
I always look forward to a programming language class.	Between Groups	1,417	3	,472	,393	,758	
	Within Groups	70,900	59	1,202			
	Total	72,317	62				
Programming language course is very	Between Groups	1,812	3	,604	,658	,581	
	Within	54,125	59	,917			

interesting to me.	Groups						
	Total	55,937	62				
I enjoyed watching a teacher work on a programming language problem on the board.	Between Groups	,433	3	,144	,187	,905	
	Within Groups	45,567	59	,772			
	Total	46,000	62				
I think of other things when a computer teacher is talking or working on a problem.	Between Groups	13,853	3	4,618	1,757	,165	
	Within Groups	155,035	59	2,628			
	Total	168,889	62				
I also like to do and think about computer courses outside of school.	Between Groups	8,328	3	2,776	1,612	,196	
	Within Groups	101,608	59	1,722			
	Total	109,937	62				
Programming language is boring.	Between Groups	12,189	3	4,063	1,910	,138	
	Within Groups	125,525	59	2,128			
	Total	137,714	62				
My mind goes blank when I see a programming language test.	Between Groups	5,710	3	1,903	,792	,503	
	Within Groups	141,719	59	2,402			
	Total	147,429	62				
I feel uneasy when I see coding problems.	Between Groups	13,697	3	4,566	2,096	,110	
	Within Groups	128,525	59	2,178			
	Total	142,222	62				
I feel nervous when a computer teacher asks me questions in class.	Between Groups	6,487	3	2,162	,802	,498	
	Within Groups	159,069	59	2,696			
	Total	165,556	62				
I feel insecure about asking computer questions in class.	Between Groups	9,429	3	3,143	1,115	,350	
	Within Groups	166,317	59	2,819			
	Total	175,746	62				

I get nervous or frightened watching a teacher work on a programming language problem on the board.	Between Groups	8,682	3	2,894	1,011	,395	
	Within Groups	168,969	59	2,864			
	Total	177,651	62				
When I take a computer test, I worry that I will get a bad grade.	Between Groups	3,462	3	1,154	,476	,700	
	Within Groups	143,142	59	2,426			
	Total	146,603	62				
I worry a lot before a computer test.	Between Groups	7,733	3	2,578	,986	,406	
	Within Groups	154,267	59	2,615			
	Total	162,000	62				
I feel at ease using the Minecraft	Between Groups	3,794	3	1,265	1,288	,287	
	Within Groups	57,952	59	,982			
	Total	61,746	62				
I think the Minecraft is too demanding for me	Between Groups	4,738	3	1,579	,501	,683	
	Within Groups	186,119	59	3,155			
	Total	190,857	62				
I will try this Minecraft game and work it out	Between Groups	2,784	3	,928	1,309	,280	
	Within Groups	41,819	59	,709			
	Total	44,603	62				
I am happy with the result obtained with the Minecraft	Between Groups	,484	3	,161	,490	,691	
	Within Groups	19,452	59	,330			
	Total	19,937	62				
I believe Minecraft provides a solution to the problem	Between Groups	9,860	3	3,287	7,584	,000	
	Within Groups	25,569	59	,433			
	Total	35,429	62				
I am receptive to the outcome of the Minecraft	Between Groups	,751	3	,250	,315	,815	
	Within Groups	46,900	59	,795			

	Total	47,651	62				
I like the way how the Minecraft is supposed to be used	Between Groups	,274	3	,091	,290	,833	
	Within Groups	18,583	59	,315			
	Total	18,857	62				
The rules associated with the Minecraft seem reasonable	Between Groups	4,082	3	1,361	1,395	,253	
	Within Groups	57,569	59	,976			
	Total	61,651	62				
I am inclined to follow the rules in using the Minecraft	Between Groups	5,981	3	1,994	2,690	,054	
	Within Groups	43,733	59	,741			
	Total	49,714	62				
It is mostly up to me whether or not I get the job done	Between Groups	7,903	3	2,634	1,108	,353	
	Within Groups	140,319	59	2,378			
	Total	148,222	62				
There is very little I can do to obtain what I want	Between Groups	3,098	3	1,033	,398	,755	
	Within Groups	152,902	59	2,592			
	Total	156,000	62				
I have complete control over the process	Between Groups	,288	3	,096	,112	,953	
	Within Groups	50,569	59	,857			
	Total	50,857	62				

Appendix G: Anova Test Result in Questionnaire

		N	Mean	Std. Deviation
When programing with Minecraft I learn more	between 2 and 5 hours a day	25	1,5200	,91833
	more than 5 hour a day	13	1,6923	,75107
	a few times a week	15	1,3333	,48795
	a few times a month	10	1,3000	,48305
	Total	63	1,4762	,73741
With Minecraft I learn better how to program	between 2 and 5 hours a day	25	1,6000	,76376
	more than 5 hour a day	13	1,3846	,86972
	a few times a week	15	1,3333	,61721
	a few times a month	10	1,2000	,42164
	Total	63	1,4286	,71198
Minecraft helps me understand programming	between 2 and 5 hours a day	25	1,4800	,71414
	more than 5 hour a day	13	1,6154	,96077
	a few times a week	15	1,4000	,50709
	a few times a month	10	1,1000	,31623
	Total	63	1,4286	,68895
I learn more quickly when working with Minecraft	between 2 and 5 hours a day	25	2,0800	1,03763
	more than 5 hour a day	13	1,8462	1,21423
	a few times a week	15	1,4667	,74322
	a few times a month	10	2,1000	1,44914
	Total	63	1,8889	1,09414
It is easy to work with Minecraft	between 2 and 5 hours a day	25	1,8800	1,09240
	more than 5 hour a day	13	2,3077	1,18213
	a few times a week	15	1,6667	,61721

	a few times a month	10	2,3000	1,41814
	Total	63	1,9841	1,08497
Minecraft is easy to use	between 2 and 5 hours a day	25	1,3600	,56862
	more than 5 hour a day	13	1,6923	1,18213
	a few times a week	15	1,3333	,61721
	a few times a month	10	2,3000	1,25167
	Total	63	1,5714	,91077
It is easy to program the Minecraft board	between 2 and 5 hours a day	25	1,8800	1,01325
	more than 5 hour a day	13	2,2308	,92681
	a few times a week	15	1,6000	1,05560
	a few times a month	10	2,5000	1,58114
	Total	63	1,9841	1,12869
Lab sessions with Minecraft are more entertaining	between 2 and 5 hours a day	25	1,9200	1,15181
	more than 5 hour a day	13	2,6923	1,60128
	a few times a week	15	2,0000	1,00000
	a few times a month	10	1,9000	1,66333
	Total	63	2,0952	1,31633
I have fun working with Minecraft	between 2 and 5 hours a day	25	1,4400	1,00333
	more than 5 hour a day	13	1,3077	,48038
	a few times a week	15	1,3333	,48795
	a few times a month	10	1,0000	,00000
	Total	63	1,3175	,71449
Working with Minecraft is more enjoyable	between 2 and 5 hours a day	25	1,6400	1,18603
	more than 5 hour a day	13	1,4615	,77625
	a few times a week	15	1,4000	,63246
	a few times a month	10	1,6000	1,26491
	Total	63	1,5397	,99718

I enjoy doing programming language	between 2 and 5 hours a day	25	1,6000	1,08012
	more than 5 hour a day	13	1,9231	1,25576
	a few times a week	15	1,3333	,48795
	a few times a month	10	1,4000	,84327
	Total	63	1,5714	,97904
Minecraft word problems fascinate me.	between 2 and 5 hours a day	25	2,0000	1,47196
	more than 5 hour a day	13	1,8462	1,28103
	a few times a week	15	1,8000	1,14642
	a few times a month	10	2,0000	1,24722
	Total	63	1,9206	1,29890
I always look forward to a programming language class.	between 2 and 5 hours a day	25	1,6800	1,21518
	more than 5 hour a day	13	1,5385	,96742
	a few times a week	15	1,8000	1,14642
	a few times a month	10	1,5000	,84984
	Total	63	1,6508	1,08000
Programming language course is very interesting to me.	between 2 and 5 hours a day	25	1,6400	1,03602
	more than 5 hour a day	13	1,7692	,72501
	a few times a week	15	1,6667	,61721
	a few times a month	10	2,1000	1,37032
	Total	63	1,7460	,94984
I enjoyed watching a teacher work on a programming language problem on the board.	between 2 and 5 hours a day	25	1,8000	,95743
	more than 5 hour a day	13	1,4615	,87706
	a few times a week	15	1,7333	,79881
	a few times a month	10	1,5000	,70711
	Total	63	1,6667	,86136
I think of other things when a computer teacher is talking or working on a problem.	between 2 and 5 hours a day	25	2,4800	1,63605
	more than 5	13	4,2308	1,36344

	hour a day			
	a few times a week	15	3,2667	1,66762
	a few times a month	10	3,7000	1,25167
	Total	63	3,2222	1,65046
I also like to do and think about computer courses outside of school.	between 2 and 5 hours a day	25	1,6800	1,34536
	more than 5 hour a day	13	2,3846	1,50214
	a few times a week	15	2,2667	1,33452
	a few times a month	10	1,7000	,94868
	Total	63	1,9683	1,33160
Programming language is boring.	between 2 and 5 hours a day	25	3,6400	1,57797
	more than 5 hour a day	13	4,4615	,96742
	a few times a week	15	3,4667	1,55226
	a few times a month	10	3,9000	1,66333
	Total	63	3,8095	1,49037
My mind goes blank when I see a programming language test.	between 2 and 5 hours a day	25	3,0400	1,69509
	more than 5 hour a day	13	3,5385	1,61325
	a few times a week	15	3,1333	1,40746
	a few times a month	10	3,5000	1,35401
	Total	63	3,2381	1,54204
I feel uneasy when I see coding problems.	between 2 and 5 hours a day	25	3,0400	1,59374
	more than 5 hour a day	13	3,3846	1,44559
	a few times a week	15	3,0000	1,46385
	a few times a month	10	3,1000	1,66333
	Total	63	3,1111	1,51456
I feel nervous when a computer teacher asks me questions in class.	between 2 and 5 hours a day	25	3,3200	1,67631
	more than 5 hour a day	13	3,6154	1,66024
	a few times a week	15	3,1333	1,68466

	a few times a month	10	4,0000	1,49071
	Total	63	3,4444	1,63409
I feel insecure about asking computer questions in class.	between 2 and 5 hours a day	25	3,5600	1,73397
	more than 5 hour a day	13	3,5385	1,80810
	a few times a week	15	3,0667	1,62422
	a few times a month	10	3,9000	1,59513
	Total	63	3,4921	1,68363
I get nervous or frightened watching a teacher work on a programming language problem on the board.	between 2 and 5 hours a day	25	3,6400	1,70489
	more than 5 hour a day	13	3,5385	1,94145
	a few times a week	15	3,6667	1,63299
	a few times a month	10	4,0000	1,63299
	Total	63	3,6825	1,69273
When I take a computer test, I worry that I will get a bad grade.	between 2 and 5 hours a day	25	3,2400	1,50776
	more than 5 hour a day	13	3,6923	1,54837
	a few times a week	15	3,0667	1,53375
	a few times a month	10	3,7000	1,70294
	Total	63	3,3651	1,53771
I worry a lot before a computer test.	between 2 and 5 hours a day	25	3,2000	1,70783
	more than 5 hour a day	13	3,5385	1,50640
	a few times a week	15	2,9333	1,62422
	a few times a month	10	4,0000	1,49071
	Total	63	3,3333	1,61645
I feel at ease using the Minecraft	between 2 and 5 hours a day	25	1,8000	1,19024
	more than 5 hour a day	13	1,0769	,27735
	a few times a week	15	1,4667	,74322
	a few times a month	10	1,4000	1,26491
	Total	63	1,5079	,99795

I think the Minecraft is too demanding for me	between 2 and 5 hours a day	25	2,8800	1,73973
	more than 5 hour a day	13	3,5385	1,80810
	a few times a week	15	3,2667	1,62422
	a few times a month	10	2,5000	1,95789
	Total	63	3,0476	1,75452
I will try this Minecraft game and work it out	between 2 and 5 hours a day	25	1,3600	,70000
	more than 5 hour a day	13	1,4615	1,12660
	a few times a week	15	1,2000	,41404
	a few times a month	10	1,5000	1,26930
	Total	63	1,3651	,84818
I am happy with the result obtained with the Minecraft	between 2 and 5 hours a day	25	1,3200	,69041
	more than 5 hour a day	13	1,3077	,63043
	a few times a week	15	1,2000	,41404
	a few times a month	10	1,1000	,31623
	Total	63	1,2540	,56706
I believe Minecraft provides a solution to the problem	between 2 and 5 hours a day	25	1,4000	,64550
	more than 5 hour a day	13	1,4615	1,12660
	a few times a week	15	1,5333	,63994
	a few times a month	10	1,3000	,67495
	Total	63	1,4286	,75593
I am receptive to the outcome of the Minecraft	between 2 and 5 hours a day	25	1,4000	,76376
	more than 5 hour a day	13	1,3077	,63043
	a few times a week	15	1,6667	,97590
	a few times a month	10	1,5000	1,26930
	Total	63	1,4603	,87668
I like the way how the Minecraft is supposed to be used	between 2 and 5 hours a day	25	1,2400	,43589
	more than 5	13	1,3846	,65044

	hour a day			
	a few times a week	15	1,4667	,74322
	a few times a month	10	1,0000	,00000
	Total	63	1,2857	,55150
The rules associated with the Minecraft seem reasonable	between 2 and 5 hours a day	25	1,4400	,76811
	more than 5 hour a day	13	1,2308	,43853
	a few times a week	15	1,9333	1,38701
	a few times a month	10	1,6000	1,26491
	Total	63	1,5397	,99718
I am inclined to follow the rules in using the Minecraft	between 2 and 5 hours a day	25	1,5200	1,00499
	more than 5 hour a day	13	1,4615	,77625
	a few times a week	15	1,5333	1,06010
	a few times a month	10	1,3000	,48305
	Total	63	1,4762	,89546
It is mostly up to me whether or not I get the job done	between 2 and 5 hours a day	25	1,7200	,89069
	more than 5 hour a day	13	1,2308	,43853
	a few times a week	15	2,4667	1,35576
	a few times a month	10	2,3000	3,12872
	Total	63	1,8889	1,54618
There is very little I can do to obtain what I want	between 2 and 5 hours a day	25	2,9200	1,57903
	more than 5 hour a day	13	2,5385	1,61325
	a few times a week	15	3,3333	1,39728
	a few times a month	10	3,3000	1,88856
	Total	63	3,0000	1,58623
I have complete control over the process	between 2 and 5 hours a day	25	1,5600	,86987
	more than 5 hour a day	13	1,3846	,65044
	a few times a week	15	1,8000	1,01419

	a few times a month	10	1,8000	1,13529
	Total	63	1,6190	,90569

		Sum of Squares	df	Mean Square	F	Sig.	Differences
When programing with Minecraft I learn more	Between Groups	1,272	3	,424	,771	,515	
	Within Groups	32,443	59	,550			
	Total	33,714	62				
With Minecraft I learn better how to program	Between Groups	1,418	3	,473	,929	,432	
	Within Groups	30,010	59	,509			
	Total	31,429	62				
Minecraft helps me understand programming	Between Groups	1,612	3	,537	1,139	,341	
	Within Groups	27,817	59	,471			
	Total	29,429	62				
I learn more quickly when working with Minecraft	Between Groups	4,057	3	1,352	1,137	,342	
	Within Groups	70,166	59	1,189			
	Total	74,222	62				
It is easy to work with Minecraft	Between Groups	4,142	3	1,381	1,183	,324	
	Within Groups	68,843	59	1,167			
	Total	72,984	62				
Minecraft is easy to use	Between Groups	7,466	3	2,489	3,340	,025	
	Within Groups	43,963	59	,745			
	Total	51,429	62				
It is easy to program the Minecraft board	Between Groups	5,936	3	1,979	1,598	,199	
	Within Groups	73,048	59	1,238			
	Total	78,984	62				
Lab sessions with Minecraft are more entertaining	Between Groups	5,919	3	1,973	1,147	,338	
	Within Groups	101,509	59	1,720			

	Total	107,429	62				
I have fun working with Minecraft	Between Groups	1,388	3	,463	,902	,446	
	Within Groups	30,263	59	,513			
	Total	31,651	62				
Working with Minecraft is more enjoyable	Between Groups	,660	3	,220	,213	,887	
	Within Groups	60,991	59	1,034			
	Total	61,651	62				
I enjoy doing programming language	Between Groups	2,772	3	,924	,962	,417	
	Within Groups	56,656	59	,960			
	Total	59,429	62				
Minecraft word problems fascinate me.	Between Groups	,511	3	,170	,097	,962	
	Within Groups	104,092	59	1,764			
	Total	104,603	62				
I always look forward to a programming language class.	Between Groups	,747	3	,249	,205	,892	
	Within Groups	71,571	59	1,213			
	Total	72,317	62				
Programming language course is very interesting to me.	Between Groups	1,635	3	,545	,592	,622	
	Within Groups	54,301	59	,920			
	Total	55,937	62				
I enjoyed watching a teacher work on a programming language problem on the board.	Between Groups	1,336	3	,445	,588	,625	
	Within Groups	44,664	59	,757			
	Total	46,000	62				
I think of other things when a computer teacher is talking or working on a problem.	Between Groups	29,308	3	9,769	4,129	,010	
	Within Groups	139,581	59	2,366			
	Total	168,889	62				
I also like to do and think about computer courses outside of school.	Between Groups	6,386	3	2,129	1,213	,313	
	Within Groups	103,550	59	1,755			
	Total	109,937	62				
Programming language is boring.	Between Groups	8,090	3	2,697	1,227	,308	

	Within Groups	129,624	59	2,197			
	Total	137,714	62				
My mind goes blank when I see a programming language test.	Between Groups	3,004	3	1,001	,409	,747	
	Within Groups	144,424	59	2,448			
	Total	147,429	62				
I feel uneasy when I see coding problems.	Between Groups	1,285	3	,428	,179	,910	
	Within Groups	140,937	59	2,389			
	Total	142,222	62				
I feel nervous when a computer teacher asks me questions in class.	Between Groups	5,305	3	1,768	,651	,585	
	Within Groups	160,250	59	2,716			
	Total	165,556	62				
I feel insecure about asking computer questions in class.	Between Groups	4,522	3	1,507	,519	,671	
	Within Groups	171,224	59	2,902			
	Total	175,746	62				
I get nervous or frightened watching a teacher work on a programming language problem on the board.	Between Groups	1,327	3	,442	,148	,931	
	Within Groups	176,324	59	2,989			
	Total	177,651	62				
When I take a computer test, I worry that I will get a bad grade.	Between Groups	4,241	3	1,414	,586	,627	
	Within Groups	142,363	59	2,413			
	Total	146,603	62				
I worry a lot before a computer test.	Between Groups	7,836	3	2,612	1,000	,399	
	Within Groups	154,164	59	2,613			
	Total	162,000	62				
I feel at ease using the Minecraft	Between Groups	4,690	3	1,563	1,616	,195	
	Within Groups	57,056	59	,967			
	Total	61,746	62				
I think the Minecraft is too demanding for me	Between Groups	7,553	3	2,518	,810	,493	
	Within Groups	183,304	59	3,107			

	Total	190,857	62				
I will try this Minecraft game and work it out	Between Groups	,712	3	,237	,319	,811	
	Within Groups	43,891	59	,744			
	Total	44,603	62				
I am happy with the result obtained with the Minecraft	Between Groups	,427	3	,142	,431	,732	
	Within Groups	19,509	59	,331			
	Total	19,937	62				
I believe Minecraft provides a solution to the problem	Between Groups	,364	3	,121	,204	,893	
	Within Groups	35,064	59	,594			
	Total	35,429	62				
I am receptive to the outcome of the Minecraft	Between Groups	1,048	3	,349	,442	,724	
	Within Groups	46,603	59	,790			
	Total	47,651	62				
I like the way how the Minecraft is supposed to be used	Between Groups	1,487	3	,496	1,683	,180	
	Within Groups	17,370	59	,294			
	Total	18,857	62				
The rules associated with the Minecraft seem reasonable	Between Groups	3,850	3	1,283	1,310	,280	
	Within Groups	57,801	59	,980			
	Total	61,651	62				
I am inclined to follow the rules in using the Minecraft	Between Groups	,410	3	,137	,164	,920	
	Within Groups	49,304	59	,836			
	Total	49,714	62				
It is mostly up to me whether or not I get the job done	Between Groups	13,041	3	4,347	1,897	,140	
	Within Groups	135,181	59	2,291			
	Total	148,222	62				
There is very little I can do to obtain what I want	Between Groups	5,496	3	1,832	,718	,545	
	Within Groups	150,504	59	2,551			
	Total	156,000	62				
I have complete control over the	Between Groups	1,620	3	,540	,647	,588	

process	Within Groups	49,237	59	,835			
	Total	50,857	62				

Appendix H: Anova Test Result in Questionnaire

Descriptive				
		N	Mean	Std. Deviation
When programing with Minecraft I learn more	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,3846	,63310
	Doing Research	7	1,7143	,48795
	Listening Music and Watching Movies	8	1,5000	,53452
	Social Networks	3	1,3333	,57735
	Others	4	2,2500	1,89297
	Total	63	1,4762	,73741
With Minecraft I learn better how to program	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,3846	,71139
	Doing Research	7	1,2857	,48795
	Listening Music and Watching Movies	8	1,6250	,74402
	Social Networks	3	1,3333	,57735
	Others	4	2,0000	1,15470
	Total	63	1,4286	,71198
Minecraft helps me understand programming	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,3846	,67338
	Doing Research	7	1,7143	,48795
	Listening Music and Watching Movies	8	1,3750	,51755
	Social Networks	3	1,3333	,57735
	Others	4	1,7500	1,50000
	Total	63	1,4286	,68895
I learn more quickly when working with Minecraft	Preparing Lesson Note	2	1,5000	,70711
	Playing games	39	1,6923	1,05516
	Doing Research	7	2,1429	,89974
	Listening Music and Watching Movies	8	2,1250	1,12599
	Social Networks	3	2,6667	,57735
	Others	4	2,5000	1,91485
	Total	63	1,8889	1,09414
It is easy to work with Minecraft	Preparing Lesson Note	2	3,5000	,70711
	Playing games	39	1,7692	,93080
	Doing Research	7	2,0000	1,00000
	Listening Music and Watching Movies	8	2,5000	1,19523

	Social Networks	3	2,3333	1,15470
	Others	4	2,0000	2,00000
	Total	63	1,9841	1,08497
Minecraft is easy to use	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,6154	,96287
	Doing Research	7	1,4286	,78680
	Listening Music and Watching Movies	8	2,0000	1,06904
	Social Networks	3	1,3333	,57735
	Others	4	1,0000	,00000
	Total	63	1,5714	,91077
	It is easy to program the Minecraft board	Preparing Lesson Note	2	2,5000
Playing games		39	1,8462	1,06471
Doing Research		7	2,1429	1,46385
Listening Music and Watching Movies		8	2,5000	1,06904
Social Networks		3	3,0000	,00000
Others		4	1,0000	,00000
Total		63	1,9841	1,12869
Lab sessions with Minecraft are more entertaining		Preparing Lesson Note	2	2,0000
	Playing games	39	1,9744	1,22447
	Doing Research	7	2,1429	1,46385
	Listening Music and Watching Movies	8	2,2500	1,38873
	Social Networks	3	2,6667	2,08167
	Others	4	2,5000	1,91485
	Total	63	2,0952	1,31633
	I have fun working with Minecraft	Preparing Lesson Note	2	1,0000
Playing games		39	1,2308	,42683
Doing Research		7	1,2857	,48795
Listening Music and Watching Movies		8	1,2500	,46291
Social Networks		3	1,0000	,00000
Others		4	2,7500	2,06155
Total		63	1,3175	,71449
Working with Minecraft is more enjoyable		Preparing Lesson Note	2	1,0000
	Playing games	39	1,5897	1,01872
	Doing Research	7	1,2857	,75593
	Listening Music and Watching Movies	8	1,5000	,75593
	Social Networks	3	1,0000	,00000
	Others	4	2,2500	1,89297
	Total	63	1,5397	,99718
	I enjoy doing	Preparing Lesson Note	2	1,5000

programming language	Playing games	39	1,4872	,82308
	Doing Research	7	1,4286	,78680
	Listening Music and Watching Movies	8	1,5000	,75593
	Social Networks	3	1,3333	,57735
	Others	4	3,0000	2,30940
	Total	63	1,5714	,97904
Minecraft word problems fascinate me.	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,9744	1,24578
	Doing Research	7	1,2857	,48795
	Listening Music and Watching Movies	8	2,1250	1,55265
	Social Networks	3	2,6667	2,08167
	Others	4	2,0000	2,00000
Total	63	1,9206	1,29890	
I always look forward to a programming language class.	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,5641	,85208
	Doing Research	7	1,7143	1,49603
	Listening Music and Watching Movies	8	1,7500	,88641
	Social Networks	3	2,3333	2,30940
	Others	4	2,0000	2,00000
Total	63	1,6508	1,08000	
Programming language course is very interesting to me.	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,7949	,97817
	Doing Research	7	1,5714	,78680
	Listening Music and Watching Movies	8	1,8750	1,12599
	Social Networks	3	2,6667	,57735
	Others	4	1,0000	,00000
Total	63	1,7460	,94984	
I enjoyed watching a teacher work on a programming language problem on the board.	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,7692	,95866
	Doing Research	7	1,5714	,78680
	Listening Music and Watching Movies	8	1,3750	,51755
	Social Networks	3	1,6667	,57735
	Others	4	1,7500	,95743
Total	63	1,6667	,86136	
I think of other things when a computer teacher is talking or working on a problem.	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	3,2821	1,60507
	Doing Research	7	2,8571	1,86445
	Listening Music and Watching Movies	8	3,2500	1,66905

	Social Networks	3	2,6667	2,08167
	Others	4	3,7500	1,89297
	Total	63	3,2222	1,65046
I also like to do and think about computer courses outside of school.	Preparing Lesson Note	2	2,0000	1,41421
	Playing games	39	1,7436	1,01872
	Doing Research	7	2,0000	1,73205
	Listening Music and Watching Movies	8	2,7500	1,75255
	Social Networks	3	2,3333	2,30940
	Others	4	2,2500	1,89297
	Total	63	1,9683	1,33160
Programming language is boring.	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	3,8974	1,42893
	Doing Research	7	3,4286	1,81265
	Listening Music and Watching Movies	8	3,7500	1,58114
	Social Networks	3	3,6667	1,52753
	Others	4	4,2500	1,50000
	Total	63	3,8095	1,49037
My mind goes blank when I see a programming language test.	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	3,5385	1,44816
	Doing Research	7	2,7143	1,70434
	Listening Music and Watching Movies	8	3,0000	1,51186
	Social Networks	3	2,0000	1,00000
	Others	4	2,7500	2,06155
	Total	63	3,2381	1,54204
I feel uneasy when I see coding problems.	Preparing Lesson Note	2	2,0000	1,41421
	Playing games	39	3,2308	1,49493
	Doing Research	7	3,0000	1,63299
	Listening Music and Watching Movies	8	3,3750	1,59799
	Social Networks	3	2,3333	1,15470
	Others	4	2,7500	2,06155
	Total	63	3,1111	1,51456
I feel nervous when a computer teacher asks me questions in class.	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	3,5385	1,61972
	Doing Research	7	2,7143	1,70434
	Listening Music and Watching Movies	8	3,8750	1,55265
	Social Networks	3	2,0000	1,00000
	Others	4	4,2500	1,50000
	Total	63	3,4444	1,63409
I feel insecure about	Preparing Lesson Note	2	3,0000	2,82843

asking computer questions in class.	Playing games	39	3,6154	1,61596
	Doing Research	7	2,5714	1,81265
	Listening Music and Watching Movies	8	3,8750	1,55265
	Social Networks	3	2,6667	2,08167
	Others	4	4,0000	2,00000
	Total	63	3,4921	1,68363
I get nervous or frightened watching a teacher work on a programming language problem on the board.	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	3,7692	1,62968
	Doing Research	7	3,0000	2,00000
	Listening Music and Watching Movies	8	3,8750	1,55265
	Social Networks	3	2,3333	2,30940
	Others	4	5,0000	,00000
Total	63	3,6825	1,69273	
When I take a computer test, I worry that I will get a bad grade.	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	3,4103	1,56807
	Doing Research	7	2,5714	1,61835
	Listening Music and Watching Movies	8	3,6250	1,50594
	Social Networks	3	3,0000	1,00000
	Others	4	4,2500	,95743
Total	63	3,3651	1,53771	
I worry a lot before a computer test.	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	3,4103	1,61763
	Doing Research	7	2,7143	1,70434
	Listening Music and Watching Movies	8	3,6250	1,50594
	Social Networks	3	2,6667	2,08167
	Others	4	3,7500	1,50000
Total	63	3,3333	1,61645	
I feel at ease using the Minecraft	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,4103	,93803
	Doing Research	7	1,4286	,78680
	Listening Music and Watching Movies	8	2,0000	1,41421
	Social Networks	3	1,3333	,57735
	Others	4	2,0000	1,41421
Total	63	1,5079	,99795	
I think the Minecraft is too demanding for me	Preparing Lesson Note	2	1,5000	,70711
	Playing games	39	3,1795	1,78991
	Doing Research	7	2,7143	1,79947
	Listening Music and Watching Movies	8	2,5000	1,85164

	Social Networks	3	3,6667	1,15470
	Others	4	3,7500	1,89297
	Total	63	3,0476	1,75452
I will try this Minecraft game and work it out	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,4359	,96777
	Doing Research	7	1,0000	,00000
	Listening Music and Watching Movies	8	1,2500	,46291
	Social Networks	3	1,6667	1,15470
	Others	4	1,5000	1,00000
	Total	63	1,3651	,84818
	I am happy with the result obtained with the Minecraft	Preparing Lesson Note	2	1,0000
Playing games		39	1,2821	,51035
Doing Research		7	1,0000	,00000
Listening Music and Watching Movies		8	1,1250	,35355
Social Networks		3	1,3333	,57735
Others		4	1,7500	1,50000
Total		63	1,2540	,56706
I believe Minecraft provides a solution to the problem		Preparing Lesson Note	2	1,5000
	Playing games	39	1,4872	,85446
	Doing Research	7	1,1429	,37796
	Listening Music and Watching Movies	8	1,2500	,46291
	Social Networks	3	1,3333	,57735
	Others	4	1,7500	,95743
	Total	63	1,4286	,75593
	I am receptive to the outcome of the Minecraft	Preparing Lesson Note	2	1,0000
Playing games		39	1,4615	,85367
Doing Research		7	1,8571	1,21499
Listening Music and Watching Movies		8	1,2500	,46291
Social Networks		3	1,0000	,00000
Others		4	1,7500	1,50000
Total		63	1,4603	,87668
I like the way how the Minecraft is supposed to be used		Preparing Lesson Note	2	1,5000
	Playing games	39	1,2821	,55954
	Doing Research	7	1,4286	,78680
	Listening Music and Watching Movies	8	1,1250	,35355
	Social Networks	3	1,3333	,57735
	Others	4	1,2500	,50000
	Total	63	1,2857	,55150
	The rules associated	Preparing Lesson Note	2	1,5000

with the Minecraft seem reasonable	Playing games	39	1,4615	,96916
	Doing Research	7	1,8571	1,57359
	Listening Music and Watching Movies	8	1,3750	,51755
	Social Networks	3	2,3333	1,15470
	Others	4	1,5000	1,00000
	Total	63	1,5397	,99718
I am inclined to follow the rules in using the Minecraft	Preparing Lesson Note	2	1,0000	,00000
	Playing games	39	1,3846	,63310
	Doing Research	7	1,7143	1,49603
	Listening Music and Watching Movies	8	1,1250	,35355
	Social Networks	3	2,3333	1,15470
	Others	4	2,2500	1,89297
	Total	63	1,4762	,89546
It is mostly up to me whether or not I get the job done	Preparing Lesson Note	2	1,5000	,70711
	Playing games	39	1,8974	1,78878
	Doing Research	7	2,2857	1,49603
	Listening Music and Watching Movies	8	1,7500	,88641
	Social Networks	3	2,0000	1,00000
	Others	4	1,5000	1,00000
	Total	63	1,8889	1,54618
There is very little I can do to obtain what I want	Preparing Lesson Note	2	3,0000	2,82843
	Playing games	39	2,9744	1,61387
	Doing Research	7	2,7143	1,49603
	Listening Music and Watching Movies	8	3,3750	1,59799
	Social Networks	3	1,6667	1,15470
	Others	4	4,0000	1,15470
	Total	63	3,0000	1,58623
I have complete control over the process	Preparing Lesson Note	2	1,5000	,70711
	Playing games	39	1,6923	,97748
	Doing Research	7	1,4286	,53452
	Listening Music and Watching Movies	8	1,8750	1,12599
	Social Networks	3	1,3333	,57735
	Others	4	1,0000	,00000
	Total	63	1,6190	,90569

ANOVA							
		Sum of Squares	df	Mean Square	F	Sig.	Differences
When programming with Minecraft I learn more	Between Groups	3,638	5	,728	1,379	,246	
	Within Groups	30,076	57	,528			
	Total	33,714	62				
With Minecraft I learn better how to program	Between Groups	2,228	5	,446	,870	,507	
	Within Groups	29,201	57	,512			
	Total	31,429	62				
Minecraft helps me understand programming	Between Groups	1,478	5	,296	,603	,698	
	Within Groups	27,951	57	,490			
	Total	29,429	62				
I learn more quickly when working with Minecraft	Between Groups	6,016	5	1,203	1,005	,423	
	Within Groups	68,207	57	1,197			
	Total	74,222	62				
It is easy to work with Minecraft	Between Groups	8,894	5	1,779	1,582	,180	
	Within Groups	64,090	57	1,124			
	Total	72,984	62				
Minecraft is easy to use	Between Groups	3,817	5	,763	,914	,479	
	Within Groups	47,612	57	,835			
	Total	51,429	62				
It is easy to program the Minecraft board	Between Groups	10,550	5	2,110	1,757	,136	
	Within Groups	68,434	57	1,201			
	Total	78,984	62				
Lab sessions with Minecraft are more entertaining	Between Groups	2,430	5	,486	,264	,931	
	Within Groups	104,998	57	1,842			
	Total	107,429	62				
I have fun working with Minecraft	Between Groups	9,049	5	1,810	4,564	,001	
	Within Groups	22,602	57	,397			

	Total	31,651	62				
Working with Minecraft is more enjoyable	Between Groups	4,036	5	,807	,799	,555	
	Within Groups	57,614	57	1,011			
	Total	61,651	62				
I enjoy doing programming language	Between Groups	8,804	5	1,761	1,983	,095	
	Within Groups	50,625	57	,888			
	Total	59,429	62				
Minecraft word problems fascinate me.	Between Groups	6,659	5	1,332	,775	,572	
	Within Groups	97,945	57	1,718			
	Total	104,603	62				
I always look forward to a programming language class.	Between Groups	3,132	5	,626	,516	,763	
	Within Groups	69,185	57	1,214			
	Total	72,317	62				
Programming language course is very interesting to me.	Between Groups	6,322	5	1,264	1,453	,220	
	Within Groups	49,615	57	,870			
	Total	55,937	62				
I enjoyed watching a teacher work on a programming language problem on the board.	Between Groups	2,071	5	,414	,537	,747	
	Within Groups	43,929	57	,771			
	Total	46,000	62				
I think of other things when a computer teacher is talking or working on a problem.	Between Groups	3,218	5	,644	,221	,952	
	Within Groups	165,671	57	2,907			
	Total	168,889	62				
I also like to do and think about computer courses outside of school.	Between Groups	7,584	5	1,517	,845	,524	
	Within Groups	102,353	57	1,796			
	Total	109,937	62				
Programming language is boring.	Between Groups	3,494	5	,699	,297	,913	
	Within Groups	134,221	57	2,355			

	Total	137,714	62				
My mind goes blank when I see a programming language test.	Between Groups	11,558	5	2,312	,970	,444	
	Within Groups	135,871	57	2,384			
	Total	147,429	62				
I feel uneasy when I see coding problems.	Between Groups	6,007	5	1,201	,503	,773	
	Within Groups	136,215	57	2,390			
	Total	142,222	62				
I feel nervous when a computer teacher asks me questions in class.	Between Groups	14,810	5	2,962	1,120	,360	
	Within Groups	150,746	57	2,645			
	Total	165,556	62				
I feel insecure about asking computer questions in class.	Between Groups	11,259	5	2,252	,780	,568	
	Within Groups	164,487	57	2,886			
	Total	175,746	62				
I get nervous or frightened watching a teacher work on a programming language problem on the board.	Between Groups	17,186	5	3,437	1,221	,311	
	Within Groups	160,465	57	2,815			
	Total	177,651	62				
When I take a computer test, I worry that I will get a bad grade.	Between Groups	8,828	5	1,766	,730	,604	
	Within Groups	137,775	57	2,417			
	Total	146,603	62				
I worry a lot before a computer test.	Between Groups	5,844	5	1,169	,427	,828	
	Within Groups	156,156	57	2,740			
	Total	162,000	62				
I feel at ease using the Minecraft	Between Groups	3,929	5	,786	,775	,572	
	Within Groups	57,817	57	1,014			
	Total	61,746	62				
I think the Minecraft is too demanding for me	Between Groups	11,768	5	2,354	,749	,590	
	Within Groups	179,089	57	3,142			

	Total	190,857	62				
I will try this Minecraft game and work it out	Between Groups	1,847	5	,369	,492	,781	
	Within Groups	42,756	57	,750			
	Total	44,603	62				
I am happy with the result obtained with the Minecraft	Between Groups	1,747	5	,349	1,095	,373	
	Within Groups	18,189	57	,319			
	Total	19,937	62				
I believe Minecraft provides a solution to the problem	Between Groups	1,411	5	,282	,473	,795	
	Within Groups	34,017	57	,597			
	Total	35,429	62				
I am receptive to the outcome of the Minecraft	Between Groups	2,851	5	,570	,726	,607	
	Within Groups	44,799	57	,786			
	Total	47,651	62				
I like the way how the Minecraft is supposed to be used	Between Groups	,454	5	,091	,281	,922	
	Within Groups	18,403	57	,323			
	Total	18,857	62				
The rules associated with the Minecraft seem reasonable	Between Groups	3,060	5	,612	,595	,704	
	Within Groups	58,591	57	1,028			
	Total	61,651	62				
I am inclined to follow the rules in using the Minecraft	Between Groups	6,763	5	1,353	1,795	,128	
	Within Groups	42,951	57	,754			
	Total	49,714	62				
It is mostly up to me whether or not I get the job done	Between Groups	2,204	5	,441	,172	,972	
	Within Groups	146,018	57	2,562			
	Total	148,222	62				
There is very little I can do to obtain what I want	Between Groups	11,055	5	2,211	,870	,507	
	Within Groups	144,945	57	2,543			
	Total	156,000	62				
I have complete control over the	Between Groups	2,793	5	,559	,663	,653	

process	Within Groups	48,064	57	,843			
	Total	50,857	62				