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INFLUENCE OF A GAME-BASED APPLICATION ON SECONDARY SCHOOL STUDENTS' SAFE INTERNET USE

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Abstract:
The purpose of this study was to investigate the influence of a game called Wild Web Woods (WWW) designed by the European Council for safe Internet use on secondary school students' safe Internet use. In line with this purpose, for the purpose of determining the students' awareness of safe Internet use, a total of 504 students from different regions in Turkey were reached. In the study, a 25-item questionnaire developed by the researchers was applied to the students. The results of the data analysis revealed that the students generally had sufficient levels of awareness of safe Internet use. In the study, 28 5th and 6th grade students attending a secondary school in the city of Balıkesir took part in the application phase of the WWW game. These students were introduced to the WWW game and asked to play the game. Following this, scenario-based application questions prepared by the researchers were directed to the students. In order to provide data triangulation and to determine the students' views about this new application, open-ended questions were directed to the students. The results demonstrated that the students' awareness of safe Internet use generally increased. Almost all the students taking education on safe Internet with the help of the WWW game gave correct answers to the scenario-based application questions. The qualitative data were interpreted within the scope of "Diffusion of Innovations Theory", and the related themes were obtained. The students regarded this game as an innovation, entertained while playing the game and stated that they wanted to use it in future. This situation can be explained as diffusion of the related innovation.

Keywords: elementary education; interactive learning environments

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1. Introduction

Today, with the use of especially smart phones and tablet computers in our daily lives, it has become fairly easy for adults as well as for children to access the Internet (Annansingh & Veli, 2016). According to the results of household research conducted by Turkish Statistical Institute on information technology use, 22,9% of the Turkish population had a desktop computer at home, 36,4% had a laptop computer at home, 29,6% had a tablet computer at home, 96,9% had a smart phone and 76,3% had Internet connection at home in 2016 (TÜİK, 2016). This result, consistent with the results of other studies reported in related literature, shows that most children in Turkey can access the Internet at home (Erdur-Baker & Kavşut, 2007; Omar, Daud, Hassan, Bolong, & Teimmouri, 2014; Topcu, Erdur-Baker, & Capa-Aydin, 2008).

The Internet has become a part of children's daily lives in Turkey (Kaşıkçı, Çağıltay, Karakuş, Kurşun, & Ogan, 2014). This situation means children are likely to be at increased risk of dangerous situations likely to be caused by Internet use (Sonia Livingstone, Haddon, Görzig, & Ólafsson, 2011). In fact, most children use the Internet for such beneficial and harmless purposes as spending time in social media, entertaining themselves (playing games, watching cartoons/movies), doing homework, communicating with friends and searching subjects they are interested in (Ersoy, 2011; S. Livingstone, Kirwil, Ponte, & Staksrud, 2014; O. Mert, 2010; Tekin & Polat, 2016). Besides this beneficial use of the Internet, it also has certain harmful aspects for children. The probable situations likely to be hazardous for children on the Internet are as follows: cyber bullying via the Internet, sexual abuse, hacking, phishing, terror, blackmail, inappropriate content and contact, virus and unsafe downloads (Kopecký, 2016; Ktoridou, Eteokleous, & Zahariadou, 2012; Van Den Heuvel, Van Den Eijnden, Van Rooij, & Van De Mheen, 2012). Cyber bullying is a disturbing and widespread actions which involve sending undesirable messages to defenseless users via the Internet, stealing passwords and displaying others' private lives via a web camera (Faccio, Iudici, Costa, & Belloni, 2014; Topcu et al., 2008). It is pointed out that mostly children with low levels of technological literacy are exposed to cyber bullying (Akbulut, Sahin, & Eristi, 2010). One out of three children experience this problem on the Internet, and most of them are girls (Ktoridou et al., 2012). Sexual abuse including exposure to messages and multimedia with sexual contents is another problem frequently experienced by children on the Internet (Kaşıkçı et al., 2014). Most of the children exposed to sexual abuse (75%) are female, and the number of male children is not low (25%) (Ktoridou et al., 2012).

Children constantly meeting such a number of risky situations on the Internet should be aware of and able to cope with these dangers. However, related studies

demonstrate that children are not much aware of these risks in the Internet environment and that they are not thus in safety (Kaşıkçı, Çağıltay, Karakuş, Kurşun, & Ogan, 2014). Especially parents who do not feel themselves efficient in technology are concerned about their children's use of the Internet and social media, and they cannot provide their children with sufficient guidance at all (Nikken & de Haan, 2015). In this respect, it is important to take the necessary precautions in relation to the risks of children's Internet use and to give them trainings regarding how to cope with these risks (Annansingh & Veli, 2016; Beder & Ergun, 2015; Kalmus, Blinka, & Ólafsson, 2015; M. Mert, Bülbül, & Sağıroğlu, 2012; Tekin & Polat, 2016; Wishart, 2004). Therefore, the purpose of this study was to investigate the influence of a scenario-based educational application prepared for safe Internet use on children's' levels of awareness of safe Internet use.

1.1. Review of related studies in literature

For the last 10 years, the project of Teacher Awareness of Internet Safety (TAIS) has been conducted in Taiwan for computer teachers. The purpose of this project, in which the design-based research method is used, is not only to prepare curricula to raise teachers' awareness of Internet Safety but also to develop various related tools that teachers can use as well as to make students more conscious of Internet Safety (Chou & Peng, 2011). In this on-going project, the interviews held with the teachers have revealed that they find this project beneficial and that it helps increase students' levels of awareness of Internet safety.

In one study conducted by Morena and colleagues (2013), a questionnaire regarding Internet safety training for children was applied to a group of participants including teachers, clinicians, parents and adolescents. According to the results, the participants pointed out that children aged 7.2 on average should start taking trainings on Internet safety. The majority of teachers, clinicians and parents were found to be willing to give this training. In addition, all the participants stated that primarily parents were those responsible for giving this training.

In another study carried out by Beder and Ergün (2015), the researchers aimed to determine secondary school students' safe Internet use. In the study involving use of a scenario-based video, it was found that the students had a high level of awareness of safe Internet use and that students in higher class grades were more conscious of safe Internet use when compared to those in lower class grades. Based on the results, it was concluded that the participants had low and moderate levels of consciousness regarding "Plagiarism" and "Problem Sharings".

In 2005, CyberCIEGE, a scenario-based game, was developed by the US Navy Forces Postgraduate School military and civil staff to raise awareness of cyber security.

In their study, Cone, Irvine, Thompson and Nguyen (2007) reported that the game can also be effective for general computer users. Similarly, Raman, Lal and Achuthan (2014) used CyberCIEGE in their study and investigated the effectiveness of the game on teaching cyber security. The participants in their study, which was conducted using the control group experimental design, were students attending the department of engineering. The students in the experimental group (N=10) were taught using the game application, and those in the control group (N=10) were not taught anything. According to the results of the test applied to both groups of students at the end of the research process, the experimental group learned better when compared to the control group.

Hendrix, Al-Sherbaz and Bloom (2016) conducted a comprehensive study reviewing the literature on use of video games in giving education regarding safe Internet use. The researchers reached a total of 28 academic studies and found that there were 15 related video games developed. Of all the 28 academic studies, 20 of them were published in 2010 or later. This result demonstrates that this is a fairly new field of research, and its importance is gradually increasing. According to the results of the study, 3D virtual world, or simulation (5 games), is the most popular type of Internet security games studied. Cyber security awareness (7), network security (6), phishing (4) and end-user PC protection (3) are the popular topics. It was seen that the primary purposes of these academic studies was "to train or raise awareness within the general public". In addition, of all the 28 studies, only 11 of them examined the influence of video games with clearly described research methods and outcomes. The results of these 11 studies revealed that "*game studies contributed to training or raising awareness of cyber security*", and other studies only mentioned positive feedback from educators and/or students.

1.2. Theoretical Framework

This study is grounded upon the Diffusions of Innovations Theory (DIT). The theory provides basis for the researches about new technologies. The data in this study were analyzed through this theory. DIT was suggested by Rogers (2003), and it consists of four main elements: innovation, communication channels, time, and a social system. In his theory, Rogers defined "innovation" as an idea, an application or an object considered to be new by an individual or organization. An innovation does not have to be a concept or a design that is definitely unknown. If an organization or individuals have not used it yet, it can be regarded as an innovation (Berger, 2005).

There are five phases in the innovation-decision process: knowledge, persuasion, decision, implementation and confirmation. Knowledge: The individual gets informed about the innovation and its use. Persuasion: The individual evaluates the positive and

negative aspects of the innovation and shapes his/her attitudes accordingly. Decision: In this step, the individual decides to accept or reject the innovation. Implementation: if the individual decides to accept the innovation, he/she employs it to a varying degree depending on the situation. Confirmation: In this stage, if the individual finds the innovation useful, he/she finalizes his/her decision whether to continue using it (Orr, 2003). In this research, the WWW game is regarded as an innovation for students because they have not used it before the research.

2. Method

2.1. Research Model

In the present study, which was designed with the mixed method, both quantitative and qualitative methods were used together in order to collect more detailed data by making use of the advantages of both methods.

In the quantitative part of the study, a 25-item questionnaire was applied to determine the elementary school students' levels of awareness of safe Internet use. Following this, a scenario-based assessment form was applied to 5th and 6th grade students attending a state school. In the qualitative part of the study, for the purpose of collecting in-depth data through an application carried out in relation to safe and conscious Internet use at a school, the related views of the students were determined using a structured interview form.

When the related literature is examined, it is seen that there are a number of classifications related to mixed methods. In a common typology developed for mixed methods, mixed method studies have a three-dimension typology: (1) Level of mixing (partially mixed versus fully mixed, (2) Time orientation (concurrent versus sequential) and (3) Emphasis of approaches (equal status versus dominant status) (Johnson & Onwuegbuzie, 2004). Depending on the typology mentioned above, the present study can be regarded as mixed method research being sequential in terms of time (quantitative-qualitative) and dominant (quantitative) in terms of status.

2.2. Data Collection Tools

In the study, the research data were collected via a questionnaire, a scenario-based assessment form and a structured interview form.

A. Safe and Conscious Internet Use Questionnaire: The questionnaire applied to determine the elementary school students' levels of awareness of safe Internet use was made up of 25 items developed by the researchers.

B. Scenario-Based Assessment Form: The scenario-based assessment form was made up of 15 questions, which were all responded to as "true", "false" and "I am neutral", and each question included a scenario regarding safe Internet use.

C. Structured Interview Form: Following the application carried out in relation to safe and conscious Internet use, an online data collection tool made up of four open-ended questions was used to determine the students' detailed views and to obtain demographic information about them.

2.3. Participants

In the study, a total of 504 students responded to the safe and conscious Internet use questionnaire. The participants were 5th and 6th grade students from different regions in Turkey. The scenario-based assessment form and the structured interview form were applied to 28 5th and 6th grade students attending a secondary school in the city of Balıkesir.

2.4. Data Analysis

The structured interview form, the scenario-based assessment form and the safe and conscious Internet use questionnaire developed within the scope of the study were applied to the students via an online application (Google forms). The quantitative data obtained from the students were analyzed using the package software of SPPS, and the descriptive statistics were examined. The results obtained are presented in tables below. The quantitative data were analyzed using the content analysis method. This process included three phases: description, analysis and interpretation. The description phase aimed to determine what the students said. In the analysis phase, the purpose was to establish relationships between the data and the themes obtained via the data. The qualitative research process suggested by Yıldırım and Şimşek (2008) was finalized with the interpretation of the research findings obtained in the study.

2.5. Validity and Reliability

The research data collected via the structured interview form were evaluated, and each researcher formed his or her own coding key for the interviews. The coding keys formed by the researchers were examined for their reliability by a field expert, and they were all found consistent with each other. Following this, the research data were categorized into themes based on the theoretical grounds. In addition, in order to reflect the students' views, related quotations were made frequently.

2.6. Application Process

In order to determine the secondary school 5th and 6th grade students' levels of awareness of safe Internet use, a 25-item questionnaire was developed and sent to 10 schools located in different regions in Turkey, and the students were asked to fill out the online questionnaire. In this application, a total of 504 students responded to the questionnaire, and the data collected were analyzed.

In the following phase, a school in the city of Balıkesir was determined. Regarding this school, for the purpose of increasing the 5th and 6th grade students' awareness and their levels of knowledge about safe Internet use, the game of "Wild Web Woods" (WWW) developed by the related UNESCO was introduced to the students. After giving brief information about the purposes of the game, the students were practically informed about how to play this game. Following this, the students were asked to play the game alone. In the next class hour, scenario-based application questions prepared in relation to safe Internet use included in the scope of the game were directed to the students. A total of 28 5th and 6th grade students responded to the questions.

Lastly, in order to determine the views of these students about the WWW game, they were asked to respond to a data collection tool made up of four open-ended questions and designed to reveal demographic information about them. In this online data collection tool, there were questions generally related to the participants' thoughts about the game, contribution of the game to safe Internet use and spread of such games.

2.7. The Wild Web Woods Game

The Wild Web Woods is an Internet-based game to teach safe Internet use to children. Figure 1 presents a screen shot of the game.

Figure 1: A screen shot from Wild Web Woods Game

This game was designed by Netzbewegung, German company, within the scope of a European Council program called "Construction of Europe for and with Children". The basic purpose of the game is to prepare users for safe Internet use by informing them about unsafe situations likely to be experienced while using the Internet. The game has a support for 27 different languages including Turkish. Each task to be fulfilled in the two-dimensional game is assigned in the form of a scenario. The characters in these scenarios are taken from various children's stories.

3. Results and Discussion

In this part of the study, the results obtained have been presented and interpreted by comparing them with those of other studies in related literature.

3.1. Demographic data

Figure 2 demonstrates demographic information about 504 students participating in the study.

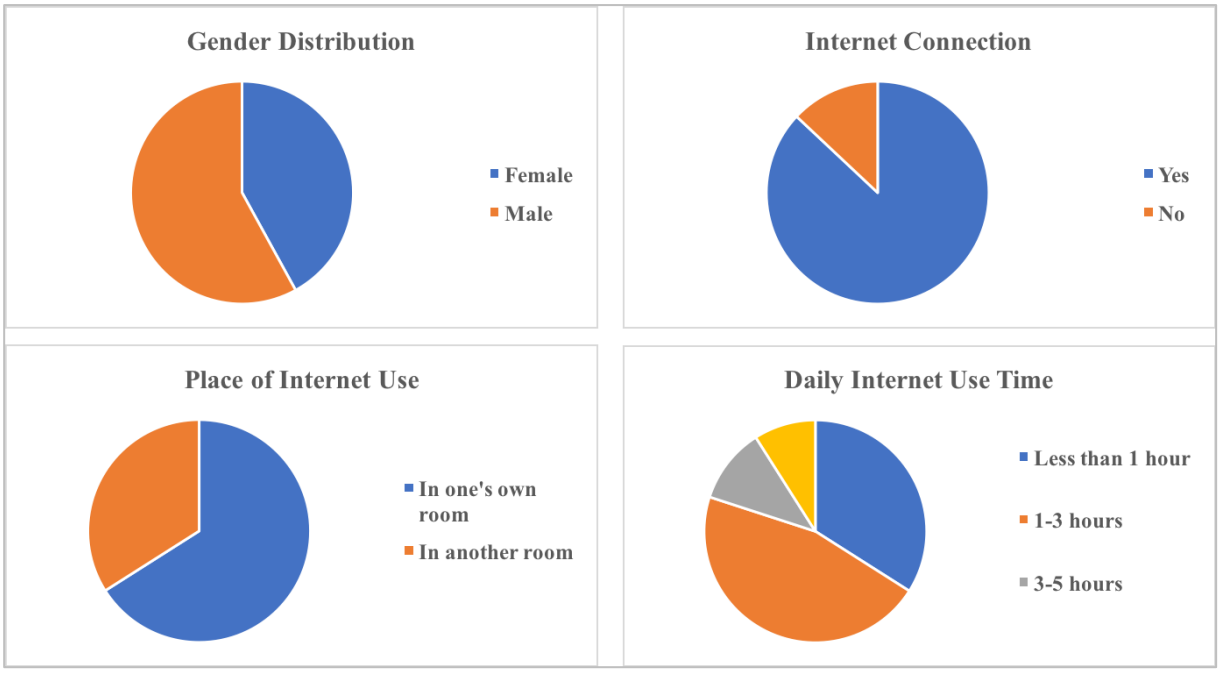

Figure 2: Demographic information

According to Figure 3, 58% of the participants were male. In the study, the question of "Do you have access to the Internet at home?" was directed to the participants, and 87% of them were found to have access to the Internet at home. This high rate of Internet connection at home is consistent with the results of other similar studies in related literature (Erdur-Baker & Kavşut, 2007; Omar et al., 2014; Topcu et al., 2008). In addition, the participants owning a computer were asked to state where they used their computers, and it was seen that 66% of them used their computers in their own rooms at home. Lastly, when the participants' daily Internet use times were examined, it was revealed that almost half of them (46%) used the Internet for 1 to 3 hours a day. Also, it was found that 34% of all the participants used the Internet for less than an hour a day. These results regarding the participants' daily Internet use times are supported by the results of another study conducted by Kaşıkçı and colleagues (2014).

3.2. Analysis of the Participants' Levels of Awareness of Safe and Conscious Internet Use

In the study, a total of, a total of 504 secondary school 5th and 6th grade students responded to the questionnaire applied to determine their safe and conscious Internet use. Among these students, 212 of them were 5th grade students, and 292 of them were 6th grade students. The items in the questionnaire were evaluated by the researchers under two headings: Internet use habits and safe Internet use. In this respect, the headings are presented in Table 1 and Table 2 below.

Table 1: Internet use habits

Questionnaire Item	Class Grade	
	5th Grade f (%)	6th Grade f (%)
For what purpose do you use the Internet?		
Watching movies / Listening to music	201(95%)	260(89%)
Playing games	152(71%)	158(54%)
Social media	141(67%)	178(60%)
Which of the following do you have knowledge about?		
Trojan Horse	64(30%)	98(34%)
Virus	196(92%)	214(73%)
Malware	60(28%)	105(36%)
Do you have unacquaintances in your Facebook friend list? (like a game-mate)		
Yes	96(45%)	87(30%)
No	116(55%)	205(70%)
Which of the following do you think is not an undesirable sharing in your Facebook account?		
Photos of Family members and friends	110(52%)	123(42%)
My personal photos	62 (29%)	63(22%)
My address	55 (26%)	61(21%)
My phone number	46 (21%)	44(15%)
Do you contact with people you do not know?		
Sometimes	84(40%)	88(30%)
Yes, always	12(5%)	10(3%)
No, never	116(55%)	194(67%)
In what ways have you acquired your knowledge about Internet use?		
My family	160(75%)	144(49%)
Computer science courses	171(80%)	143(49%)
My friends	84(40%)	91(31%)
Do you think shopping via the Internet is safe?		
It depends on the shopping website	116(55%)	162(55%)
Yes	16(7%)	20(7%)
No	80(38%)	110(38%)
Do you create passwords involving your personal information for your accounts (date of birth, name-surname and so on)?		
Yes	175(82%)	158(55%)
No	37(18%)	134(45%)
Does any member of your family come near you when you use a computer?		
Sometimes	130(61%)	202(69%)
Yes, always	49(23%)	40(14%)
No, never	33(16%)	50(17%)
Whom do you easily share the passwords of your Internet accounts with (Facebook, twitter, e-mail)?		
My family members	157(74%)	200(68%)
My friend	39(18%)	34(12%)
My teacher	7(3%)	17(6%)
One of my relatives	21(9%)	30(10%)
Everyone	2(1%)	1(1%)
No one	79(37%)	68(23%)

The participants' responses to the questions directed to determine their overall Internet use habits revealed the data presented in Table 1. It was seen that the participants used the Internet mostly for the purposes of watching movies and listening to music. Playing games and social media were among other prominent purposes. These findings are parallel to those reported in related literature (Ersoy, 2011; S. Livingstone et al., 2014; O. Mert, 2010; Tekin & Polat, 2016). The participants were asked about certain terms and situations regarding Internet use to determine their awareness of these terms and situations. It was found that the participants were familiar with the term virus and that they had low level of awareness of such safety terms as the Trojan Horse and malware. In addition, the participants were asked to state whether their friend list in Facebook included any person, they did not know. The results revealed that 45% of the 5th grade participants and 30% of the 6th grade participants responded to this question as "Yes". Moreover, almost half of the participants reported that they did not find it undesirable to share the photos of their family members or friends via their Facebook accounts. Similarly, most of the participants did not consider it to be unfavorable to share their personal photos, addresses or phone numbers. In the study, another question asked the participants whether they contacted with people they did not know via the Internet. `

According to the results, 45% of the 5th grade students and 33% of the 6th grade students stated that they established communication with other people whom they were not acquainted with. In addition, a great majority of the participants found online shopping safe. It was also seen that 82% of the 5th grade students created passwords for their accounts using information about their birth of date, name and surname, while this ratio was 55% for the 6th grade students. Another question under this heading, the participants were asked to state in what ways they had acquired their knowledge about Internet use. The students' responses to this question mainly included family, computer science courses and friends. As for the last question, the participants were asked to state whether any members of their family came near them while they were using their computer. It was seen that about 16% of them responded as "Yes, always". In addition, most of the participants stated that they shared the passwords for their Internet accounts with their family members. The ratios of the responses as "No one" were 37% for the 5th grade students and 23% for the 6th grade students.

Table 2: Safe Internet Use

Questionnaire Item	Class Grade	
	5th Grade f(%)	6th Grade f(%)
Have the passwords of your accounts or of your relatives' ever been stolen (Facebook, e-mail, twitter and so on)?		
Yes	65(30%)	86(29%)
No	147(70%)	206(71%)
Whom do you share any negative situation you experience on the Internet with (stolen passwords, fraud, insult and so on)?		
My family	167(79%)	209(72%)
My friend	78(37%)	92(32%)
No one	55(26%)	38(13%)
Do you know which website you will use to report any negative situation you will experience on the Internet (harassment, fraud, cyber bullying and so on)?		
Yes	66(31%)	85(29%)
No	146(69%)	207(71%)
Do you know how to recover your Facebook or e-mail account when it is hacked?		
Yes	54(25%)	48(17%)
I don't think it is necessary	16(8%)	18(6%)
No	142(67%)	226(77%)
Have you ever been exposed to any undesirable behaviors of other people you contact via the Internet (asking for money, any information about your credit card and your phone number; drug, terrorist propaganda and so on)		
Yes	11(5%)	20(7%)
No	201(95%)	272(93%)

In the study, several questions were directed to the participants regarding their safe Internet use. The participants' responses revealed the data presented in Table 2. The participants were asked to state whether any passwords of their Internet accounts had ever been stolen or not. Of all the participants, around 30% of them reported that the passwords of their accounts or of their acquaintances' had been stolen before. The participants were also asked to state whom they easily shared such a situation with, and most of them responded as "My family". Another question asked the participants to state what they would do when they experienced such negative situations via the Internet as harassment, fraud, bullying and hacking. Among all the students, around 70% of them did not know how to report such undesirable actions. Moreover, the ratios of the students who did not know how to recover their hacked accounts were 6% for the 5th grade students and 77% for the 6th grade students. Under this heading, the last question was directed to the students to reveal whether they were exposed to any undesirable behaviors of other people they contacted with the Internet. In relation to this question, very few of the participants responded as "Yes".

3.3. Findings Regarding the Scenario-Based Assessment Form

The research data collected from the 5th and 6th grade students via the scenario-based assessment form were gathered under three headings: Conscious computer and Internet use, safe Internet use and conscious social network use. Among the participants filling out this form, 14 of them were 5th grade students, and 14 of them were 6th grade students. Regarding the scenario-based questions directed in the form, the participants were asked to mark one of the three choices: "true", "false" and "I am neutral". The number of the participants' correct responses to the questions related to conscious computer and Internet use can be seen in Table 3 below with respect to their class grades.

Table 3: General Internet Use

	Number of Correct Responses	
	5th Grade	**6th Grade**
1. While downloading the files necessary for her homework via the Internet, Rapunzel preferred safe websites and scanned the downloaded files using the antivirus software she installed on her computer to check whether the files were virus-infected or not.	12	13
2. Rapunzel liked playing games on her computer a lot. Please evaluate the situations below:		
a. She thinks it is not bad to spend a lot of time in front of computer.	9	9
b. She plans her time to play computer games.	8	10
c. She also spends time studying her lessons as well as with her friends besides playing computer games.	9	10
3. While playing online games, Rapunzel does not think it is dangerous to share any personal information about her like her name or her address with other players.	12	12
4. Please evaluate the below situations that Rapunzel was exposed to.		
a. Rapunzel does not play any online games which do not respect human rights or which insult people.	9	11
b. Rapunzel does not visit websites which insult people.	11	10
c. She does not warn her friends against such websites.	10	9
7. The Snow white Princes has decided to buy a mobile phone via the Internet. She orders one without doing any research about the website which sells that phone at a much lower price than its market price.	10	12

When the participants' responses to the scenario-based questions presented in Table 3 were examined, it was seen that their consciousness of downloading files via the Internet was raised. Most of the participants agreed that it was necessary to use antivirus software to scan the files they downloaded via the Internet. Regarding the question related to playing computer games, the participants reported that it was not

good to spend too much time in front of the computer; that it was necessary to plan their time to play computer games; and that they needed to spend time studying their lessons and with friends besides playing computer games. It was also seen that almost all the participants gave correct responses to the question related to sharing personal information while playing online games. Lastly, most of the participants responded correctly to the question related to doing online shopping without doing any research.

Table 4 below presents the number of correct answers given by the students to the questions regarding conscious and safe Internet use with respect to their class grades.

Table 4: Precautions for Harmful Contents

	Number of Correct Answers	
	5th Grade	**6th Grade**
5. The Snow white Princes wants to do research on a subject via the Internet. She clicks on the links of the related websites in the search engine without paying attention to whether these links are safe or not.	10	12
6. The Snow white Princes has started a blog of her own, she does not share any personal information about her like her address and phone number for the purpose of safety.	11	13
12. The little red riding hood likes reading e-mails a lot. She reads all the e-mails in her mailbox without paying attention to the sender.	10	11
13. The little red riding hood knows that many harmful materials can be sent via e-mail. Therefore, she is careful when she downloads and open the files sent via e-mail.	12	13

In this section including questions related to safe Internet use, the participants' responses to these questions are presented in Table 4. It was seen that the participants found it wrong to click all the links they faced while doing search on the Internet. It was also revealed that there were positive changes in the participants' views about sharing their personal information on their own webpages. Most of the participants gave correct responses to the question regarding their e-mail accounts. It could be stated that the participants' consciousness was raised especially in relation to opening the files sent via e-mail. Table 5 below presents the correct responses of the students to the questions related to conscious computer and Internet use with respect to their class grades.

Table 5: Conscious Social Network Use

	Number of Correct Responses	
	5th Grade	6th Grade
8. Cinderella sees someone in the Facebook account of Snow white Princes and wants to know who that person is. Using the profile of Snow white Princes, Cinderella wants to get information about that person. For this purpose, she asks Snow white Princes to give the password of her Facebook account. Since Snow white trusts her friend, she shares the password of her Facebook account with Cinderella.	12	14
9. Snow white Princes and the seven dwarfs live in the same house, and they all have only one computer at home. Snow white Princes and the seven dwarfs share the computer at home. Snow white Princes saves the password of her Facebook account on the computer she shares with the seven dwarfs.	11	11
10. The little red riding hood likes chatting in chat rooms on the Internet. She thinks she learns a lot from other people in these chat rooms. However, she knows that these people use nicknames instead of their real names. She thus avoids sharing personal information about her with others in these chat rooms.	11	11
14. Cinderella feels herself very lonely due to the bad behaviors of her sisters and her stepmother. Thus, she creates a social media account and shares all the personal information about her like photos, phone number, address and age.	12	13
15. Cinderella starts chatting via her social media account with an unacquainted person who says his name is Simon. Simon tells Cinderella that he wants to play a game with her and tries to learn where she lives. Cinderella says to Simon that she will go skating after school.	11	13

In the last part, the scenario-based questions were related to the participants' social network use. It was seen that the participants had positive views about sharing their passwords and looking at their social media accounts via their friends' accounts. It could be stated that the participants were conscious of saving the passwords of their social media accounts on shared computers. In addition, the participants found it wrong to share personal information about them with other people in virtual chat rooms. Moreover, it was seen that the participants tended to use social media as a result of probable loneliness in their real lives and raised their consciousness of sharing their photos and such information about them as phone numbers and addresses. Lastly, the participants thought that it was not right to share their real-life locations with unacquainted people in social media.

3.4. Responses to Open-Ended Questions

In the study, the students receiving training on safe Internet use with the help of the WWW game responded to some open-ended questions. The participants' responses were examined and gathered under three themes: Benefits of training, views about the game and spread of the game (Table 6).

Table 6: Themes

Theme	f
Benefits of training	
Conscious Internet use	18
Distinguishing reliable sources	10
Knowledge of law and rights	5
Using reliable sources	8
Views about the game	
Informative	24
Entertaining	22
Boring	2
Spread of the game	
It should be spread	24
I am neutral	2

In the study, the students were asked about the benefits of the training given to them via the WWW game regarding safe and conscious Internet use. Their responses revealed that most of them agreed on the theme of conscious Internet use. In relation to this, S5 said: "*I was unable to make good use of the Internet before playing this game. But now, I am carefully about the games and files I download, and I don't have any unacquainted person in my Facebook account…"* Similarly, S11 said: "*Previously, I didn't have any antivirus software installed in my computer. I used to download music and games via any website, and my computer used to break down all the time. But now, I use my computer more safely".* Almost half of the students reported that they were now able to distinguish reliable sources thanks to the related training. In addition, most of them stated that they were able to use reliable sources when they needed. In relation to this, S2 said: *"… in the past, I used to click any website I meet when I search something. I had to cope with a number of pop-up advertisements. Once, my computer was even infected with virus. Now, I don't click all the websites I meet on the Internet."* Some students stated that they learned their rights related to Internet use. Regarding this, one of the students (S4) said: *"…sometimes, there are people insulting via Facebook, and now, I know how to report these people to authorities".*

In the study, the students were asked questions regarding the game they played during their training. According to their responses, almost all the students agreed that the game was informative and entertaining. In relation to this, S8 said *"I knew all the characters in the game, and I entertained a lot while playing the game."* On the other hand, a very few students found the game boring. The students were also directed questions regarding the spread of the game, which involved training on safe and conscious Internet use. Almost all the students claimed that such games should be more common. In relation to this, one of the students (S7) said: *"Games are really interesting for us. I wish*

everything were as entertaining as games. Then, we would learn everything without any boredom".

4. Conclusion

The present study primarily tried to determine secondary school students' levels of awareness of safe Internet use in various regions of Turkey. The findings obtained revealed that the students had low levels of awareness of safe Internet use. This result demonstrated the need for giving safe Internet use training at early ages. Therefore, the educational game of WWW, which was designed by the European Council in relation to safe Internet use, was applied to secondary school students in the city of Balıkesir. The safe Internet use awareness levels of the students who played the game were measured using a scenario-based assessment form developed by the researchers. In order to obtain more in-depth data, open-ended questions were directed to the students who played the game.

As a result of the questionnaire applied to secondary school students from various regions of Turley, it was found that most of the students had access to the Internet and that 66% of them used the Internet for more than an hour a day. In addition, 66% of them used the Internet in their own rooms at home. Considering the ratios of the students with access to the Internet, their daily Internet use time and availability of access to the Internet in their own rooms at home, they need to know how to behave in probable cases of negative situations they are likely to meet on the Internet. However, when the results obtained via the questionnaire were examined, it was seen that especially in relation to social media use, the students were found to demonstrate unsafe behaviors. For instance, it was revealed that a majority of the students made friends with unacquainted people via social media and that they did not find it dangerous to share personal information about them like their phone numbers or their location of accommodation. In addition, it was seen that the students were not sufficiently knowledgeable about creating the passwords of their accounts safely via the Internet. Moreover, most of the students could be said to be careless about sharing the passwords of their Internet accounts with other people.

In the study, it was seen that almost one-third of the students' passwords of their Internet accounts were stolen previously and that most of them did not share this negative situation with anybody. In addition, around 73% of the students did not know how to recover their stolen accounts. Furthermore, a majority of the students did not know whom to apply to in cases of harassment, fraud and cyber bullying. This result is consistent with the above finding related to the students' low level of awareness of safe Internet use.

In the study, it was seen that most of the students gave correct responses to the scenario-based questions after playing the game called WWW. In this respect, it could be stated that there was an increase in the students' levels of awareness of safe Internet use. For example, it was seen that almost all the students' consciousness of safety of the files downloaded via the Internet after playing the game was raised and that they were careful about sharing personal information about them via the Internet. In addition, the students reported that they would not order anything via the Internet without first doing related research on the online shopping website. Moreover, it was revealed that most of the students were now carefully about the safety of the websites they reached via search engines as well as about opening their e-mails and downloading the files sent via their e-mails. Lastly, in relation to social network sites, the students mostly gave correct answers to the questions related to sharing their passwords and other personal information about them like their photos, phone numbers and address.

The students' responses to the open-ended questions supported the data collected via the scenario-based measurement tool. Most of the students stated that the game was beneficial in terms of conscious use of the Internet. In addition, almost all the students found the game informative and entertaining. Similarly, most of the students reported positive views about the spread of the game. When viewed from the diffusion of innovations theory, the WWW game could be said to be an innovation for the students. Considering the positive views of the students, it could be stated that the students adopted this innovation and wanted the game to reach more students.

5. Suggestions

Considering the fact that there was positive change in the students' awareness of safe Internet use, it is important to involve such games more in education. Also, parents, who have the primary responsibility for their children's safe Internet use, should be made aware of such applications. In addition, researchers could contribute to the field by conducting similar experimental studies regarding such educational games.

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