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Secondary School Mathematics Teachers' Views on the Use of Web 2.0 Tools

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Abstract

This research aims to reveal the opinions of secondary school mathematics teachers about Web 2.0 tools. In the study, which was designed according to the case study, one of the qualitative research methods, the participants were determined by using easily accessible case sampling, one of the purposeful sampling methods. The study group the research consisted of 8 mathematics teachers working in a school affiliated with the Ministry of National Education in the Gebze district of Kocaeli province in the 2021-2022 academic year. The interview method was used in the data collection phase of the research. Content analysis, one of the qualitative data analysis techniques, was used to analyze the data obtained from the interviews. It has been observed that teachers have general knowledge about technology tools, but some teachers do not use them because they do not know and do not see themselves as sufficient. It is seen that Web 2.0 technology tools, unlike the traditional approach, increase the use of technology, offer a variety of teaching methods, save time, provide a fun environment and create more active learning. Teachers have learned that Web 2.0 technology tools provide reinforcement and permanent learning to strengthen the understanding of the subject, strengthen the lecture, and increase the student's participation in the lesson because they appeal to more than one sense and are fascinating. Technology tools allow students to embody these concepts because they have difficulty learning abstract concepts. They indicated that it enriched its content.

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INTRODUCTION

There has been a rapid change in information technologies in recent years, and alternative ways of sharing information are developing. With these developments in information and technology, people can share existing information more quickly, making it much easier to share information. Thanks to easily accessible information, time is saved, and a collaborative working environment is provided (Çelik, 2020). New technologies emerging today make themselves felt in every field. It has also been widely used in the field of education. These technologies, which are used to increase the effectiveness of education, are essential because they allow a student-centered education environment, and each student can work at their own pace (Özarbaş & Mart, 2017).

While the tools used in the educational environment were usually blackboards, chalk, and books in the past, recently, smart boards, projectors, power tools, etc., point presentations are significant innovations provided by the internet and the internet. Technology tools have also been included in the classroom environment with new developments (Çelik, 2020). These technologies provide the opportunity for teachers to create engaging classroom activities. One of these technologies that allow students to work collaboratively in the classroom and to participate in the teaching process actively is web 2.0 tools.

Web 2.0 technology tools? The term Web 2.0 is expressed as "next-generation" Internet technologies that facilitate interaction with the user (Özarbaş and March 2017). These technology tools are environments prepared for reading content and creating content, and improving sharing capabilities. It allows individuals to socialize, exchange information, share, put forward original ideas, reveal their creativity, and work collaboratively. However, these environments provide a self-learning environment as well as providing socialization. In addition to addressing cognitive learning, it helps practical and social learning that addresses learning skills, where the responsibility of learning is taken. Web 2.0 technologies enable students to gain experience by providing a natural learning environment and encouraging global awareness, innovation, active participation, creativity, critical thinking skills, and cooperation (Yıldırım, 2020).

Web 2.0 tools provide a natural environment and collaboration and help students take control of their learning. Web 2.0 technology offers essential applications for transforming learning and teaching processes for teachers and students in learning and teaching processes (Private & Arıkan, 2015). The Ministry of National Education has developed the FATIH Project in education to develop the skills of "problem-solving, use of technology, analytical thinking, working together, effective communication and cooperation" for 21st-century citizenship skills (Karakuş and Er,2020). Today, web 2.0 tools that serve this purpose, that teachers can easily apply in the classroom and that can be used in teacher education, are given in Table 1 by using the relevant literature (Çelik, 2020).

Table 1 . Web *2.0 Tools that can be Applied in the Classroom and Used in Teacher Education*

categories	*Web 2.0 Applications*
Mind Map Apps	Coggle, Mindomo, Wisemapping, SpiderScribe, Inspiration 9, Mindmeister, MindMaple Lite, Gocongr, Pooppet
Clipboard Creation Applications	Blendspase, Lino it, Wordle, Padlet, Bubble, RealtimeBord
Poster and Cartoon Creation Applications	Word Art, Make Beliefs Comix, Sketch Toy, Face Your, Canva, Toondoo
Manga Story and Book Writing Apps	Wattpad, Pixton, Storyjumper, Joomag, Storyboard

	That, Storybird
Note Taking and Blogging Applications	Evernote, Trello, Blogger, Tlumblr, Gloster
Quiz and Puzzle Creation Applications	Flippquiz, Puzzlemaker, Triventy, Kahoot, Plickers, CrossWordLabs, Quiziz, Socrative, Mentimeter, LearningApss
Presentation and Animation Applications	Prezi, Powtoon, Emaze, Vyond, Voki, Mine-Imitator, Scratch, Buncee
Information Poster and Infographic Preparation Applications	Easelly, Visme, Venngage, Creately, Piktochart
Distance Education and Virtual Classroom Applications	Edmodo, Moodle, Google Classroom, Classdojo, Remind, Whiteboard, Adobe Connect, Bigbluebutton, EBA
Virtual and Augmented Reality Applications	Aurasma, Quiver, Animal 4D Photography, Morpho, Augmented Reality (AR), Nearpod, Space 4 D
Film and Video Editing and Design Applications	Thinklink, GIMP, Mowi maker, Photostory, Safeshare, OpenShot, Filmora, Nimbb, Jing, SmartDraw, Vocaro, Davinci 15 Beta, AppInventor
Social Media Applications	Blog, Wiki, Youtube, Skype, Hangout, Whatsapp, Facebook, Instagram, WebQuest

Steel, T. (2020). Perceptions of social studies teacher candidates about the process of integrating web 2.0 technologies into their fields. *Ahi Evran University Journal of Kirsehir Education Faculty*, *21* (2), 875-915.

Web 2.0 tools make the learning process efficient, provide a learning environment in which the student is more active, and allow student-centered understanding by eliminating teacher-centered understanding. Many researchers have expressed the benefits, such as making it easier for the student to interact with the content and the teacher and supporting students to use their research, questioning, and problem-solving skills through cooperative learning (Özmen et al., 2011). There are studies stating that Web 2.0 technology tools affect the education process positively (Elmas & Geban, 2012; Baş & Turhan, 2017; Altıok, Yükseltürk & Üçgül, 2017). Teachers' knowledge about the place of Web 2.0 technology tools in the learning process is meaningful and valuable with classroom applications. It is essential for teachers to put their theoretical knowledge about Web 2.0 technology tools into practice in the classroom and to create these environments for effective and permanent learning (Özpınar, 2020). This study, which was carried out in line with the explanations stated, aimed to reveal the opinions of secondary school mathematics teachers about Web 2.0 tools.

METHOD

In this section, the model used in the research, the research participants, the data collection tools, and the data analysis are given.

MODEL OF THE RESEARCH

For the research method, the most appropriate qualitative research method was determined. The reason for the determination of this method; is the examination of events and perceptions in their natural environment, with a realistic perspective and by considering all their aspects. The qualitative research method was chosen because the focus of this subject is considered to be researched humans, and human behaviors should be investigated only with a flexible and holistic approach (Çiftçi et al., 2013). The case study method, one of the qualitative research methods, was used in this study. The case study is a method used in in-depth research where the answers to the questions of why and how are primarily preferred in cases where the control of the

researchers over the events is insufficient and the starting point is related to real life. The case study gives more detailed and realistic information than the studies conducted with general scanning models. Case study surveys are performed in cases where general surveys are deemed insufficient. In this respect, a case study provides an opportunity to investigate an event, situation, or person in detail (Dündar & Akyol, 2014).

It is to conduct an in-depth analysis to reveal how the web 2.0 tools, which is the aim of the study, were perceived by the participant group, why they were used, and what kind of results they had. This research method was used to explain the results obtained by making an in-depth analysis based on the why and how questions of Web 2.0 tools.

PARTICIPANTS

In the study, the study group was determined by using the purposive sampling method. In purposive sampling, the most appropriate units are considered to be the best for the research (Baştürk & Taştepe, 2014). In this study, easily accessible case sampling, one of the purposeful sampling methods, was used. Convenience sampling is a method in which the researcher does not have the opportunity to use different sampling methods, chooses a situation that is close and easy to access, and obtains fast and practical results (Yıldırım & Şimşek, 2021).

In this research, eight mathematics teachers working in a school affiliated with the Ministry of National Education in Gebze district of Kocaeli province were interviewed in the 2021-2022 academic year. Four teachers participating in the research are female, and 4 are male. The ages of the participating teachers vary between 29 and 42 years, and their tenure in the profession varies between 5 and 18 years. Demographic information of the participating teachers is presented in Table 2.

Table 2. *Demographic Information of Participating Teachers*

Teachers	*Gender*	*Age*	*Professional Experience (Years)*
S1	Woman	42	18
S2	Woman	35	14
S3	Woman	29	5
S4	Woman	31	9
S5	Male	29	7
S6	Male	35	13
S7	Male	31	8
S8	Male	36	16

The research did not use teacher names, and coding was made to indicate the teachers. Throughout the study, teacher codes S1, S2, S3, S4, S5, S6, S7, S8 specified as.

DATA COLLECTION TOOLS

The interview method was used in the data collection process of this study. Interviewing is an effective method to reveal the feelings and experiences of individuals, their views, and data on the subject. Since it is based on speech, it provides a natural environment and eliminates limitations. In the preparation of the interview form, the questions should be easy to understand and focused, the questions should be based on interpretation, the questions should be of different types, and multidimensional questions should be asked and arranged logically (Yıldırım & Şimşek, 2020). In light

of this information, the researcher prepared semi-structured interview questions by scanning the literature on the subject. The prepared interview questions were arranged by taking expert opinions, and the semi-structured interview form containing eleven open-ended questions took its final form. Some of the questions in the interview form are given below.

- Web 2.0 technology? What do you think about Web 2.0 tools?
- Web 2.0 tools in your lessons? Please explain why you use or do not use it.
- Web 2.0 tools do you use? Explain why you use Web 2.0 tools in your lessons.
- Why do you prefer to use Web 2.0 tools in the classroom environment?

The semi-structured interview form applied to the teachers consists of two parts. In the first part of the interview form, questions were created to determine the demographic characteristics of teachers, and in the second part, open-ended questions such as "How," "What," and "Why" were created about web 2.0 tools and questions were asked to obtain in-depth information about the subject.

COLLECTION OF DATA

The data of the research were collected in March 2022. Before starting to collect the data, the researcher informed the data collection group about the importance of this study and the participants for this study. The interviews with the teachers were carried out in the school's Science laboratory. A semi-structured interview consisting of 11 open-ended questions was applied to the teachers participating in the research. Before the interview, necessary permissions were obtained from the school administration where the teachers work. During the interview process, the interviewer's primary duty is to ensure that the other party responds comfortably, honestly, and accurately to the questions asked (Çiftçi et al., 2013). In order to provide this comfort, the questions were asked in daily conversation language and were carried out in an informal atmosphere. During the interview, permission was obtained from the participants to record the interviews, and they were informed that the interview records would be kept confidential. Interviews with each participant took approximately 25-30 minutes. At the end of the interview items, the participants were asked whether they had any comments they wanted to add, and the interview was terminated. Later, these interview recordings were transcribed without deteriorating the original. The written data was shown to the participants by hand, and they were asked to confirm, and the data collection was completed.

ANALYSIS OF DATA

Content analysis, one of the qualitative data analysis techniques, was used to analyze the data obtained from the interviews. The primary purpose of content analysis is to reach concepts and relationships that can explain the collected data. The process performed in content analysis is to gather similar data within the framework of specific concepts and themes and to interpret them by arranging them in a way the reader can understand. (Sözbilir, 2009). In content analysis, the data is first conceptualized, then logically organized according to the emerging concepts, and the subjects explaining the data are determined.

The reason for using content analysis in this research is that the data obtained from semi-structured interviews are divided into specific sub-themes. A conclusion is reached by making logical inferences based on these themes. Considering the data obtained from semi-structured interviews, similar data were coded. After the entire data set was coded, similar codes were combined into appropriate sub-themes. The classified codes were rechecked, and the codes covering each other

were rearranged to control the themes. The data obtained from the examinations are shown in the table. It has been tried to define, explain and relate the data obtained from coding the themes.

For this reason, direct quotations have been included, considering different views and compatibility with the theme. Codes were used to indicate which participant the quotations belong to. For example, the S1 code is the number one teacher, S5 code represents the teacher number five.

RELIABILITY AND VALIDITY

One of the essential scientific research criteria is the credibility of the results. From this point of view, validity and reliability are among the most common criteria used in research. Lincoln and Guba (1985) suggest strategies to increase the quality of qualitative research. These suggestions are not made with the concepts of validity and reliability accepted in quantitative research but with alternative concepts suitable for qualitative research. These concepts are credibility, transferability, consistency, and confirmability. These concepts and methods for increasing quality are long-term interaction, variation, expert review, participant confirmation and deep-focus data collection for credibility, detailed description for transferability, and purposive sampling. (Lightning and Lightning, 2021). In this study, the researcher used expert opinion, participant confirmation, and purposive sampling to increase validity and reliability. At the same time, two researchers coded the same data, ensuring inter-coder reliability. In this way, it is possible to reach a shared vision about what the encodings mean and which piece of data belongs to which code (Arastaman , Öztürk Fidan & Fidan, 2018).

In the research, the audio recordings of the interviews with the participants were transcribed without changing the original. Written documents were shown to the participants by hand, necessary confirmations were obtained, and they were asked if any places needed to be changed. In addition, starting from the preparation of the questions, the coding at the end of the interview and the confirmation of the expert were consulted during the stages of the research.

FINDINGS/RESULTS

This section presents the findings obtained as a result of the analysis of the data collected by the interview method suitable for the research. With content analysis, interview questions were analyzed, and themes were created from interview questions in this direction.

TEACHER OPINIONS ON WEB 2.0 TECHNOLOGY TOOLS

The codes, frequencies, and quotations about the codes regarding the teachers' thoughts about Web 2.0 technology tools are given in Table 3.

Table 3. Theme 1: *Teachers' Views on Web 2.0 Technology Tools*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Enjoyable	More lively classes Making the lesson fun for students Making the lesson fun for teachers	4	S1, S2, S3, S4	S4 - *"… because the lessons are more lively, it is more fun for the students and me."*
concretization	Making abstract concepts concrete	2	S2, S6	S2- *"… I have personally identified the benefits of using these tools*

				for students, especially on abstract subjects. Abstract concepts become concrete."
Permanent learning	Making learning permanent visually and audibly	2	S4, S6	S6- *"It is used in education to be more memorable and provide permanent visual and audible learning."*
Lack of Knowledge	Having no idea what it is used for	2	S7, S8	S8- "*I heard the names of these tools, but I do not have enough idea about what they are and why they are used."*
Interesting	Make the lesson interesting for teachers	one	S5	S5- "I received *online training on this. There were different and beautiful vehicles. I was interested in the use of the course."*

Table 3 shows teachers' views on Web 2.0 technology tools. Opinions about Web 2.0 technology tools are as "Fun" (4), "Concrete" (2), "Permanent Learning" (2), "Lack of Knowledge" (2), and "Interesting" (1).

Four teachers emphasized that the Web 2.0 technology tools make the learning environment enjoyable for both the teacher and the student, as the student's interest in the lesson increased. Their interest increased. 2 of them are effective in concretizing abstract concepts because they are supported with visuals and videos, 2 of them are that the topics are more memorable because the technology tools used visually and audibly support teaching, and 1 of them is that the use of technology tools in the learning environment, unlike traditional teaching methods, makes the lesson enjoyable. Stated. Two of the teachers stated that they had heard of Web 2.0 technology tools by name but did not have enough information about what these tools cover and why they are used.

2.0 TECHNOLOGY TOOLS USED BY TEACHERS

The teachers about the Web 2.0 technology tools they use are given in Table 4.

Table 4. *Theme 2: Web 2.0 Technology Tools Used by Teachers*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Math Tools	Geogebra, Z-Book	6	S1, S2, S3, S4, S6, S7	S2- *"I am using the Geogebra mathematical tool."* S1- *"I use Z-books actively."*
Survey and Exam Applications	Kahoot, Google Form, Eba Google Drive	6	S1, S3, S4, S5, S6, S8	S3- "I use *Kahoot to evaluate the end of the subject and to create competition in the lesson ."* S4- *"I use Google forms, and eba Google drive is among the tools I use most often."*
Distance Education and Virtual Classroom	Zoom, Skype	2	S4, S8	S4 -*"We all taught lessons through zoom during the distance education process. I also used zoom. Skype is among*

Applications				*the tools I use."*
Poster and Cartoon Creation Applications	Canva, Wordart	2	S3, O4	S3- *"… I used canvas to use visuals related to the lesson ."* S4 -*"… I use WordArt a little bit ."*
Clipboard Creation Applications	padlet	one	S3	S3 -*"… I also used the padlet program to use visuals related to the lesson ."*

Table 4 includes teachers' views on Web 2.0 technology tools they use. When we look at the web 2.0 technology tools that teachers use in their lessons, it is seen that six teachers use math tools, six teachers use survey and exam application tools, two teachers use distance education and virtual classroom tools, two teachers use poster and cartoon creation tools, and one teacher uses clipboard creation tool. It is seen that the mathematics tool Geogebra (6) and the survey and exam application tool Kahoot (6) are used the most. In addition, teachers can teach Zoom (2) and Skype (2). It has been observed that they use Canva (2), Wordart (2), and Padlet (1) applications.

OBJECTIVES OF TEACHERS TO USE WEB 2.0 TOOLS IN THEIR LESSONS

The codes for the teachers' purposes of using Web 2.0 technology tools, the frequencies of the codes, and the quotations about the codes are given in Table 5.

Table 5. *Theme 3: Teachers' Purposes for Using Web 2.0 Technology Tools*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
reinforcement	Use in reinforcing the subject	5	S1, S2, S3, S4, S6	S2- "*I use it to reinforce the topics. For example, the subject is reinforced with the program I use when explaining geometric objects."*
Permanent learning	Provides visual permanence Provide auditory permanence	4	S2, S3, S6, S8	S6- "*I use the tools we use to provide permanent learning together with visual and auditory perception."*
Evaluation	Assessing the students between the subjects Evaluation of students at the end of the topic	3	S1, S4, S7	S7- "*I am preparing for online practice exams. Thus, I evaluate the students at the end of the subject or during the breaks."*
Participation	Ensuring student participation in the lesson	2	S3, S4	S3- "I *generally use it to ensure participation in the course by choosing the appropriate tool for the learning outcome and content of the course ."*
Take attention	Attracting students' attention in the lesson	2	S4, S7	S4- "*Mathematics is a difficult and boring course for students. Since breaking this prejudice is up to us, we are looking for alternatives to attract students' attention. I usually use these tools to get students' attention in class."*
concretization	Making abstract	2	S6, S8	S6- *"… because our lesson is abstract, I*

	concepts concrete			*use these tools while drawing graphics. It makes it more tangible."*
Sourcing	Finding resources for the course	one	S1	S1- "*It allows me to find resources quickly. I can reach several sources simultaneously and go to different question solutions."*
not using	Not using these tools actively in the course	one	S5	S5- *"I did not use any of these acts as a teacher. The region we were in was not conducive to this."*

Table 5 shows the teachers' purposes for using Web 2.0 technology tools. When the teachers' opinions were examined, five teachers stated that they used it to strengthen their understanding of the subject and reinforce the lecture. Four teachers stated that it provided permanent learning due to the visual support of the subject. Two teachers stated that they used it to increase students' participation in the lesson because it appealed to more than one sense and was enjoyable. 2 teachers stated that the concepts and topics in the mathematics lesson are primarily abstract and because students have difficulty learning abstract concepts, technology tools provide the opportunity to embody these concepts, so they use them in the lesson. One teacher stated that he used it because it allowed accessing various resources quickly, enriching the lecture in the lesson and enabling the students to see many types of questions. At the end of the subject, three teachers stated that they used these technology tools to evaluate using various measurement tools different from the ones the students were accustomed to.

THE EFFECT OF WEB 2.0 TOOLS USED IN THE COURSE ON STUDENTS

2.0 tools used in the course on students. The codes for the codes' codes, frequencies, and quotations about the codes are given in Table 6.

Table 6. Theme 4: The Effects of Web *2.0 Tools Used in the Course on Students*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Positive	Increased interest in the lesson Participation in the lesson Paying attention to the lesson	7	S1, S2, S4, S5, S6, S7, S8	S5- *"First of all, students who move away from mathematics because of the procedural subjects in the mathematics lesson suddenly focus on the lesson and participate with this teaching method. There is an increase in their interest in the course."*
Negative	Creating a screen dependency	one	S3	S6- *"I think it has negative and positive effects on students. It is like screen addiction."*

In Table 6, teachers' views on the effects of web 2.0 tools used in the course on students are given. When the opinions of the teachers were examined, it was seen that seven teachers had a favorable opinion. The fact that technology tools are used to attract the attention of the students by creating a new learning environment in the classroom, and they participate in the lesson with interest, as well as the fact that the participation in the lesson is high and the abstract concepts are made more concrete and the level of understanding of the subjects increases, so that both teachers and students enjoy the lesson, making the lesson enjoyable is a positive outcome. Makes up blood.

One teacher expressed a negative opinion. In addition to its positive effects, the thought that it causes screen addiction in students creates a negative opinion.

THE EFFECT OF WEB 2.0 TOOLS USED IN THE COURSE ON TEACHERS

2.0 tools used in the course on teachers. The codes for the codes' codes, frequencies, and quotations about the codes are given in Table 7.

Table 7. Theme 5: The Effect of Web *2.0 Tools Used in Class on Teachers*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Positive	Making the lesson fun Saving time Cost savings Increasing the pleasure of learning	7	S1, S2, S3, S4, S5, S7, S8	S3- *"As it makes the lesson fun, it can increase the teacher's pleasure and saves time and money."*
Negative	Having a complicated effect on teachers The need for training to use	one	S6	S6- *"When we look at the effects on teachers, it makes it more difficult. Because it needs to be reinforced as usage, it is necessary to know this training, so I do not prefer it too much."*

Table 7 shows the effect of web 2.0 tools used in the course on teachers. Teachers' views on the subject are included. Seven of the teachers expressed a favorable opinion. The fact that technology tools make the lesson more fun by taking away from monotony, that it provides the opportunity to use more exercises in a short time, and that it provides the opportunity to use measurement and evaluation tools at the end of the subject creates a positive opinion on the teachers. At the same time, the fact that it saves time and that the lesson is more exciting and fun, together with these factors, has a positive effect on teachers. One of the teachers expressed a negative opinion. The fact that technology is in constant development and it is challenging to keep up with it, to get training in order to master the use of such technology tools and to keep the information alive creates a negative opinion on the teacher.

2.0 TOOLS USED IN THE COURSE ON THE EDUCATIONAL ENVIRONMENT

2.0 tools used in the course on the educational environment. The codes for the codes' codes, frequencies, and quotations about the codes are given in Table 8.

Table 8. Theme 6: The Effect of Web *2.0 Tools Used in the Course on the Educational Environment*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Positive	Providing a more lively environment in the lesson Providing a more fun environment in the lesson Entertaining students Creating an active learning	8	S1, S2, S3, S4, S5, S6, S7, S8	S4 -*"It creates a more lively and fun environment. I see more positive interactions and communication because students have fun. The number of students discussing, generating ideas, and commenting on a subject is increasing. In short, it creates an active learning environment."*

environment

Table 8 shows the effect of web 2.0 tools used in the course on the learning environment. Teachers' views on the subject are included. All of the teachers who participated in the study expressed favorable opinions. The use of technology tools in the classroom environment, unlike the traditional approach, increases the use of technology, offers a variety of teaching methods, and saves time. Because it attracts the attention of students, it enables them to focus. For this reason, more active learning occurs. These factors create a favorable opinion of teachers.

People and Situations Affected by Teachers' Use of Web 2.0 Tools

Teachers are affected by using Web 2.0 tools. The frequencies of the codes and the quotations about the codes are given in Table 9.

Table 9. *Theme 7: People and Situations Affected by Teachers' Use of Web 2.0 Tools*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Peer Advice	Influence of teachers and friends on each other	6	S1, S2, S3, S4, S7, S8	S2- *"I think my teacher friends are effective in my use of web 2.0 tools. I learned these tools from my friends on social media."*
Online Education	Learning from online training about technology tools	one	S5	S5- "I received *online training on web 2.0 technology tools. I learned from there."*
student success	The effect on students' course achievement	2	S2, S7	S2- *"I think that the instantaneously changing course success of our students is effective in my use of these tools."*
Making Narration Easier	Technology tools make teaching easier	one	S6	S6- *"There is no influence of students or anything else on my use of these tools. I use it because it facilitates the narration of the subject."*

Table 9 includes the people, and situations teachers are affected by using Web 2.0 tools. Seven teachers said they heard about web 2.0 technology tools from their colleagues and used them later. In this direction, the positive aspects of technology tools when used in the classroom and the teachers' transfer of their own experiences have shown that they have an impact on the teachers. 2 stated that the use of technology tools by the teachers was effective in influencing the success of the students and taking into account the wishes of the students. One teacher stated that he received online training about technology tools and that this was how he got to know the tools.

3.8 PROBLEMS FACE TEACHERS USING WEB 2.0 TOOLS

The teachers encountered while using the Web 2.0 tools are given in Table 10.

Table 10. *Theme 8: Problems Teachers Encounter While Using Web 2.0 Tools*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Technical glitches	Problems caused by insufficient infrastructure Internet-related problems	5	S2, S4, S6, S7, S8	S7- "Sometimes *we may experience problems due to insufficient infrastructure and sometimes due to problems in the internet."*
Inability to keep up with technology	Inability to keep up with the development of technology Not knowing how to use technology tools do not worry	one	S1	S1- *"The rapid development of technology caused me to worry about what to do and how to do it because I could not keep up with this development."*
Different Usernames	A student enters the system with more than one name in some applications.	one	S3	S3- *"When I was competing in Kahoot, I noticed that the students entered the system many times with different usernames to increase their scores ."*
I did not use	Not using technology tools	one	S5	S5- *"I cannot say anything about the problems encountered because I did not use it."*

Table 10 includes teachers' views on the problems they encounter while using Web 2.0 tools. 5 of the teachers stated that they could not bring these tools and technology to the classroom environment in cases where the school is located and lacks infrastructure. At the same time, it has put them in situations that will prevent them from using these tools in the problems experienced on the internet. For this reason, they see technical difficulties as a problem. One of the teachers stated that the problem of not being able to reach reliable results in the measurement and evaluation process due to this shortcoming of the system is that they log in to the system with multiple different user names in order to increase the grades of the students while applying on the web 20 tool that they use during the measurement and evaluation phase. One of the teachers stated that he could not express an opinion about the problems because he did not use technology tools in the classroom. Another one stated that he could not keep up with the developing technology. By self-criticism, he stated that he was worried that he could not keep up with the developments, and this situation was a problem for him.

OPINIONS ON WHETHER TO RECOMMEND WEB 2.0 TOOLS TO THEIR COLLEAGUES

The codes of whether teachers recommend web 2.0 tools to their colleagues, the frequencies of the codes, and the quotations about the codes are given in Table 11.

Table 11. *Theme 9: Teachers' Opinions on Whether They Recommend Web 2.0 Tools to Their Colleagues*

Theme	*Codes*	*Frequency*	*Teacher Codes*	*Quotation*
Yes	Recommending tech gadgets to colleagues	6	S1, S2, S3, S4, S7, S8	S7- *"I recommend it. I recommend learning and*

				using tools I do not know and using them more actively. I think it is necessary to keep up with the developing technology."
No	Not recommending tech gadgets to colleagues Wasting time in class	one	S6	S6- *"Frankly, when we use these tools in the lesson, we lose time. For this reason, it becomes difficult to train the curriculum."*
I did not use	Not using technology tools in the lesson	one	S5	S5- *"I did not use it in class, so I cannot say anything."*

Teachers' views on whether they recommend web 2.0 tools to their colleagues. Six of the teachers stated that the technology tools used to facilitate the teaching of the lesson make the students more active in the lesson and that it is necessary to bring new methods to the learning environment by keeping up with the developing technology and advised their colleagues to use these technology tools. One of the teachers did not recommend these tools to their colleagues, thinking they would waste time in the lesson and cause problems in the curriculum that needs to be trained. One of the teachers stated that they did not have an opinion on the recommendation point because they did not use it. However, the general opinion agrees with the positive effects of technology tools in terms of education and training.

DISCUSSION, CONCLUSION, AND IMPLICATIONS

This study, which aims to reveal teachers' views on Web 2.0 technology tools, was conducted with a qualitative method. When the results obtained from the analysis of the teachers' views are examined in general, it is seen that the teachers have general knowledge about Web 2.0 technology tools, that these tools positively affect the educational activities and learning environment, enable students to participate in the lesson, provide concretization in the teaching of the abstract mathematics course, and transform the educational environment into traditional It can be said that it makes it more fun by getting away from the methods. In this direction, the students have positive opinions about the lesson.

Teachers have learned that Web 2.0 technology tools provide reinforcement and permanent learning to strengthen the understanding of the subject, strengthen the lecture, and increase the participation of the students in the lesson because they appeal to more than one sense and are fascinating. Technology tools allow embodying these concepts because they have difficulty learning abstract concepts. They enriched its content. In this direction, it can be said that using Web 2.0 technology tools will ensure teaching effectiveness. Similarly, in their studies, Korucu and Karalar (2017) stated that Web 2.0 technology tools enrich the course content, that the prepared course contents are exciting and remarkable for the students, and thus teaching is more effective.

Views on the benefits of Web 2.0 technology tools are examined; Unlike the traditional approach, it is seen that it increases the use of technology, offers a variety of teaching methods, saves time, provides a fun environment, and creates more active learning. Korucu and Karalar (2017) stated that they save time in their studies, while Menteşe (2013) stated that they enrich the course environment in their study and that it will replace traditional methods. Similarly, Şenyurt and Şahin (2022) stated in their studies that it makes students more active and provides learning by having fun.

Keeping up with the developing technology is essential in increasing the quality of education and training. The constant change also affects people. Continuing with traditional methods in the face of this development may be a disadvantageous situation. For this reason, it can be thought that teachers should have a more profound knowledge of these tools and use them actively. This situation can enable teachers who stay updated with new developments to be more effective against new-generation students. In the studies of Karakuş and Er (2021), it was stated that Web 2.0 tools would be used more in the future and that teachers should change in the face of new generation students.

It has been observed that teachers have general knowledge about technology tools, but some do not use them because they do not have the knowledge and do not see themselves as sufficient. Training teachers on Web 2.0 technology tools can enable teachers to keep up with technological developments and enrich the course content. The fact that teachers consider themselves competent in using these tools can increase the rate of use. In this direction, Şenyurt and Şahin (2022) stated to the teachers in their study that data training would increase their knowledge level, and thus, the use rate of technology tools will increase.

In addition to those who recommend technology tools to their colleagues, some teachers state that using them in classroom practices will be a waste of time. Özpınar (2020) also stated in his study on pre-service teachers that there are participants who stated that Web 2.0 technology tools are challenging to implement in the classroom and cause a waste of time. When the limitations in the use of Web 2.0 technology tools are examined, they can be listed as the technical problems of the teachers, the problems encountered due to the infrastructure and internet access, the inability to have sufficient knowledge of technology tools and, accordingly, the inability to use technology tools. In this direction, Özpınar (2020) grouped the limitations under two themes, infrastructure, and software, in his study for teacher candidates. He expressed the use of the internet, the problems in the infrastructure, and the limitations caused by the software.

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