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INVESTIGATION OF SCIENCE TEACHERS' VIEWS ON KAHOOT, SOCRATIVE, QUIZIZZ AND MY QUIZ APPLICATIONS, WHICH ARE WEB 2.0 BASED ASSESSMENT AND EVALUATION TOOLS

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Abstract:
In this study, it is aimed to examine the views of Science teachers about Kahoot, Socrative, Quizizz and My Quiz applications, which are Web 2.0 based assessment-evaluation tools. The study group of the research consists of 5 science teachers working in public schools in Karapınar district of Konya province in the 2022-2023 academic year. The study group was selected by convenience sampling method, which is one of the purposive sampling methods. The phenomenology design, which is one of the qualitative research methods, was used in the research. The data were obtained with a semi-structured interview form. The pilot study of the questions in the interview form was carried out with a total of 3 science students who were outside the study group and volunteered for the interview. After the pilot study, it was checked whether the interview form was clear, understandable and suitable for examining the research problem, and the semi-structured interview form was given its final form. After the semi-structured interview form applied to the study group, the data were evaluated by content analysis and the findings obtained in this context; It is gathered under three main themes as Cognitive Competence, Affective Competence and Technological Competence. Each theme is grouped into sub-themes. Science teachers stated that the Web 2.0-based assessment and evaluation tools Socrative, Kahoot, Quizizz, and My Quiz applications mostly attract attention, contribute to meaningful and permanent learning, and help in collecting motivation. In addition, science teachers stated that they carry out technology-supported education activities using Web 2.0-based activities.

Keywords: Web 2.0 based assessment and evaluation tools, qualitative research, content analysis, phenomenology, convenience sampling

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1. Introduction

The impact of technology on human life is increasing day by day. These rapid developments in technology show their effects, especially in education. Web technologies are the leading areas where technology shows itself in education (Eyüp, 2022).

Today, with the widespread use of computers, internet, tablets and wireless networks, smart boards installed within the scope of the Fatih project carried out by the Ministry of National Education in schools show that technology is an indispensable element in education. It is also stated in the Ministry of National Education 2023 Vision Document that with this project, the Ministry of National Education aims to improve the technology use level of students and teachers, effective communication skills, analytical and creative thinking skills, researching, questioning, curious and collaborative working skills (Karakuş & Er, 2020).

In today's conditions, where digital literacy is increasing rapidly, classical measurement and evaluation tools are insufficient. Scientific researches conducted in recent years have revealed that there is an increase in the success of students and in-class performance as a result of the correct integration of technology into educational environments (Altıok et al., 2017).

The integration of learning-teaching strategies and technology produces results that significantly affect student success (Sen, 2020). Again, studies have revealed that with the combination of education and technology, students learn permanently, learn while having fun, increase their motivation towards the lesson, and students feel more comfortable in the classroom environment (Hava & Şen, 2021).

The acceleration in technological developments has also caused changes in the existing educational environments. With the introduction of these developments into educational environments, technology-based innovative learning environments have begun to emerge. Teaching in online environments with technological applications is spreading rapidly (Çallı, 2019).

These technology-based applications have many different uses in education. Web technologies are at the forefront of the fields where technology shows itself in education. Today, Web 2.0 supported assessment and evaluation tools are the most prominent among Web technologies used in every step of education. The most important reasons for the preference of Web 2.0 supported applications, where multimedia sharing such as images, sound, animation and video, which can be easily applied at all levels of education, are preferred, is that they provide social sharing opportunities and ease of access and use (Gündüzalp, 2021).

Web 2.0 supported applications also contribute to technology literacy (Çelenk & Tatlı, 2022). Web 2.0 supported applications also show positive effects in areas such as mutual cooperation, improvement in communication skills, and individual multi-faceted development (Eyüp, 2022).

Web 2.0 supported applications are especially preferred at the measurement and evaluation stage of education (Yılmaz, et al., 2021). In the results of the evaluation made

by using alternative measurement and evaluation tools supported by Web 2.0, misconceptions in students are revealed and thanks to the immediate feedback and corrections, learning is ensured to be effective and efficient. Thanks to Web 2.0 supported applications, the education process is fun and permanent learning takes place (Ülker, 2022).

In addition, it provides great convenience to teachers with its advantages such as rapid and detailed analysis of the measurement results using Web 2.0 tools and preparing questions in different question types with visual and auditory support. Teachers need to support assessment and evaluation activities with Web 2.0 tools, taking into account the needs of the age (Turan, 2021).

2. Methods

In this section, the method to be used in the research, the study group of the research, data collection tools and data analysis are mentioned.

2.1. Research Design

Qualitative research is one of the forms of information gathering developed to analyze the depth of human self-understanding, social content and methods. In studies using qualitative methods, there is an effort to reach a vast amount of information about the events examined (Baltacı, 2019).

Using the qualitative research method, the researcher can conduct individual or group interviews. He/she will be able to analyze records and documents related to the subject he/she will research. Analysis is carried out by grouping the data obtained from these areas according to various themes, categories and situation examples with content analysis. The quality of qualitative data is largely based on the honesty, sensitivity and domain dominance of the researcher (Patton, 2014).

In this study, the phenomenological design of the qualitative research method was used. In this design, questions such as how people experience phenomena, how they understand and describe the phenomenon, what they think about the phenomenon and how they have thoughts about the phenomenon (Patton, 2014). In phenomenological studies, data sources are individuals or groups that can reflect or express the phenomenon. Interviews are conducted in order to reveal the experiences related to the cases. If the researcher offers the participant an interaction environment based on trust and empathy, the facts will be revealed more clearly. Studies using phenomenology do not reveal definitive and generalizable results. It only helps us to understand, assimilate and recognize a phenomenon (Büyüköztürk et al., 2020).

In the research process, first of all, national and international literature was searched. Semi-structured interview form questions were prepared to collect data for the research question, which was found to be lacking in the literature. A pilot study of the questions was conducted on 3 volunteer science teachers. Then the questions were given their final form. The research was completed in 4 weeks (one month) in total as a result

of interviews with five volunteer science teachers working in a state secondary school located in the center of Konya-Karapınar district. The interviews were held in the school counselor's room. The answers given by the participants to the questions were noted without intervening. The final answers were confirmed by reading aloud to the participants. The answers given by the participants were evaluated by subjecting them to content analysis and the study was finalized.

2.2 Study Group

Convenience sampling (easily accessible sampling, convenient sampling or convenient sampling) technique, which is one of the purposeful sampling methods, was used in the formation of the study group. While the easy sample (Baltacı (2018,) is defined as "*choosing the easiest one, saving time, money and effort at the expense of knowledge and reliability*", Patton (2014) defined it as "*the least credible, saving time, money and effort*". Büyüköztürk et al. (2020) "*formed the most accessible of the participants until they reach the required number of groups for the researcher*".

The study group of this research consists of 5 (3 male and 2 female) science teachers working in public schools in the Karapınar district of Konya province in the 2022-2023 academic year. The professional seniority of teachers varies between 4-10 years. The characteristics of the teachers in the participant group are given in the following table.

Table 1: Features of the workgroup

Teacher Code	Gender	Year
T1	Woman	4
T2	Woman	6
T3	Man	10
T4	Man	10
T5	Man	8

2.3 Data Collection Tool

A semi-structured interview form was used as a data collection technique in the research. The pilot study of the questions in the semi-structured interview form prepared to reveal the opinions of science teachers about Kahoot, Socrative, Quizizz and My Quiz applications, which are Web 2.0 based assessment and evaluation tools, was carried out with a total of 3 science teachers who were outside the study group and who voluntarily participated in the interview, working in different schools. After the pilot study, it was checked whether the semi-structured interview form was plain, understandable and problem-oriented, and the form was given its final shape.

The semi-structured interview takes their place in qualitative research in the field of educational sciences due to its standard stretching feature at a certain level. Both fixed option and researched topics can also combine going in-depth (Karademir & Akgul, 2019).

A semi-structured interview is more suitable than the structured interview technique in terms of spreading the subject over a wide area. In this technique, the

researcher plans the questions to be asked beforehand and prepares the form containing the questions. The researcher can make changes in accordance with the course of the interview. The most important advantage of the semi-structured interview is that it provides planned and comparable information (Türnüklü, 2000).

Semi-structured interviews; it also has disadvantages such as loss of control, spending too much time on irrelevant topics, and decreased reliability due to problems that may arise between the participant and the researcher (Büyüköztürk et al., 2020).

The semi-structured interview form used in the research is of the open-ended question type consisting of five questions. It is aimed to have a suitable and quiet environment in the interviews. For this reason, the school counselor's room was generally used. The interviews lasted an average of 20-30 minutes.

Validity in qualitative research is that the researcher solves the problem he encounters as objectively as possible. Validity is examined in two ways as internal and external validity. Internal validity: It is the adequacy of the process followed while reaching the research results in revealing the truth in all its aspects. External validity is expressed as the generalizability of research results. In a qualitative research, the researcher should explain in detail the data collection process, the analysis and interpretation of the data, the fact that the data does not contradict itself and how it provides this confidence (Baltacı, 2019).

A study cannot be called persuasive without reliability, validity, and therefore internal consistency. The reliability of a measurement or evaluation to be made at an acceptable value depends on its validity. For this reason, reliability and validity are indispensable basic concepts, especially in qualitative research. In qualitative research, reliability is used to express the probability of always giving the same results when the measurements obtained in a study that is always the same are applied to different participant groups by different researchers (Arslan, 2022).

To increase credibility, transferability and consistency in research; The boundaries of the study subject were drawn and the pilot study of the semi-structured interview form was conducted with 3 volunteer science teachers. In this direction, necessary arrangements were made in the semi-structured interview form and the data collection tool was finalized. Participants participated in the research process voluntarily. The answers given by the research group to the interview questions were read aloud to the participants without changing them and the answers were confirmed. While sharing the findings of the research, the answers given by the participants were quoted directly. Participating teachers were coded as Ö1, Ö2..., their names and school information were hidden in line with the protection of personal information and ethical rules.

2.4 Data Analysis

The data obtained after the application were evaluated with content analysis. Content analysis; It is the process of digitizing the data that people say or write by coding them under various themes or titles. While evaluating in content analysis, similar data are

collected under certain themes or headings, and interpretation is made by arranging them in a way that the reader can understand (Akpınar & Özdaş, 2013).

In content analysis, there are stages of coding the data, finding the relevant themes, organizing the codes and themes, and defining and interpreting the findings (Karademir & Akgül, 2019).

The names and school information of the science teachers participating in the research were kept confidential. Participants; It was coded as T1, T2, T3, T4 and T5. The findings obtained as a result of the analysis of the qualitative data in the research were gathered under three main themes. These themes are; Cognitive competence is in the form of Affective competence and Technological competence. Sub-findings for each main theme are shown in the table below.

Table 2: Separation of views into themes and sub-themes

Theme	**Sub-Theme**
Cognitive Competence	Making an assessment Using learned knowledge
Affective Competence	Arouse curiosity Providing motivation
Technological Competence	Willingness to use technology Being open to innovation

Looking at Table 3, the views of science teachers on Kahoot, Socrative, Ouizizz and My Quiz applications, which are Web 2.0 based assessment and evaluation tools, are as follows:

> "*When used in a science lesson, it contributes to the understanding of the lesson because it increases the visuality, and students can establish a meaningful relationship between the subjects. This enables meaningful learning to take place…" and "these tools make it easier to understand the units and topics covered in the science lesson…*" (T1)

> "*…at the end of the lecture, it provides the opportunity to determine how much the students understand the subject or what they do not understand, and while doing this, it provides the opportunity to evaluate the students individually...*" (T2)

> "*I have never heard of these applications, I have no idea...*" (T3)

> "*They emphasized the sub-themes of making assessment and evaluation and using the learned information by expressing that "I use it to make assessment and evaluation at the end of my lesson. Also, I prepare a test and assign it to my students, and they do it using applications as homework, then I check and evaluate each student individually and give them feedback...*" (T4)

In the main theme of affective competence, science teachers stated that they affect the features such as arousing curiosity and providing motivation for Kahoot, Socrative, Ouizizz and My Quiz applications, which are Web 2.0 based assessment and evaluation tools. The views of pre-service teachers on the main theme of affective competence are as follows:

"*…students are more interested and willing to the lesson. I also organize various competitions using these applications, and a sweet competitive environment is created among the students….*" (T1)

"*These applications attract the attention of the students, and they are very helpful especially when starting a new unit, attracting attention, arousing curiosity and making them think…*" (T2)

"*I can't comment because I don't use it in my classes...*" (T3)

"…learning makes learning fun, and most of all, I divide the class into groups and use these applications to do quizzes, and the students are very satisfied with this situation. They often say that they like the lesson very much…" (T4)

"They emphasized the sub-themes of arousing curiosity and providing motivation by expressing that "more meaningful learning takes place because it provides motivation and students are very enthusiastic about the lesson…"". (T5)

In the main theme of technological competence, science teachers stated that Web 2.0-based assessment tools such as Kahoot, Socrative, Ouizizz and My Quiz applications affect variables such as willingness to use technology and being open to innovation. The opinions and ideas of the pre-service teachers regarding the main theme of technological competence are as follows:

"*I did not receive any training on these web 2.0-based applications. I learned to use it by researching myself. I had a hard time when I first started using it, but now I don't have it…*" (T1)

"*I use applications very easily. I had an in-service training introducing Web 2.0 tools. It has been very beneficial to me. In general, I am good with technological applications. I am talented in this field…*" (T2)

"*I think my current coursework is sufficient, so I did not feel the need to research these applications…"* (T3)

"I know about kahoot and socrative application, I also use it in my lessons, but I have not heard of Quiziz and My Quiz application. I learned kahoot and socrative application from a science teacher friend who had been trained in these applications before. I would like to research and learn about the other two applications. After our meeting, I would definitely like to research it on the internet and apply it to my lesson." (T4)

"I know about these applications, but I only use the Quzizz application. I found this app by accident. I would like to learn about the other applications you mentioned. Frankly, I do not think that my teacher friends use technology sufficiently. Especially in classroom applications, the use of technology is insufficient. The Ministry of National Education should also contribute to us teachers in this regard, and teachers should be informed about this issue through face-to-face or distance in-service trainings." (T5)

The other question of the research is what are the views of science teachers about Web 2.0 based assessment and evaluation tools? The answers given by science teachers to this question are as follows:

"*…technological applications. Internet is required to use. It is used in lessons. There are some good apps out there. I use the free ones. Some apps require a subscription, all of them should be free, actually…"* (T1)

"*Applications used on computers, smart boards or tablets. I use it. I like it, it makes our life easier and makes lessons enjoyable. I also received an in-service training to get to know Web 2.0 tools…*" (T2)

"*…web I've heard of an app called 2.0 tools, but I don't know anything about its content, I just heard its name…"* (T3)

"*I know web 2.0 tools as mobile apps. There are apps that I use. However, I do not think that my knowledge is sufficient…*" (T4)

"*I don't know much, I can't define it. However, I can say that it is the general name of the applications opened from the phone or computer smart board using the internet.*" (T5)

3. Findings and Results

The research conducted to determine the views of science teachers on Kahoot, Socrative, Ouizizz and My Quiz applications, which are Web 2.0 based assessment and evaluation tools, is a qualitative research model. 5 science teachers working in Konya-Karapınar district participated in this research voluntarily. Participants were asked 5 questions prepared with a semi-structured interview form. Responses were not interfered with. After the participants answered each question, their answers were read aloud. After the

answers were confirmed by the participant, the other questions were passed. The same procedures were repeated after each question. The data obtained were evaluated within the scope of qualitative research and content analyzes were made. The answers given by the participants to the interview form were given by quoting directly from the participants in the findings part of the research. The data obtained in the research were collected under three main themes: Cognitive competence, Affective competence and Technological competence. These main themes are also divided into sub-themes.

Chien & Wu, (2020) investigated the effect of science teachers on the level and attitudes of using Web 2.0-based assessment and evaluation methods and the performance levels of students. 494 science teachers and 1774 eighth and eleventh grade students from 32 different schools participated in the study. The data were grouped by hierarchical linear modeling method. As a result of the analysis of the data, no significant relationship was found between the level of science teachers' use of Web 2.0-based assessment and evaluation applications and the course performance grades of the students.

Timur et al., (2020) examined the views of science teachers about measurement tools used based on Web 2.0 in their studies. Eight science teachers working in the Ministry of National Education and privately working in different provinces participated in the study. Data were collected by semi-structured interview method. As a result of the study, it was concluded that the teachers were aware of Web 2.0-based applications, they used these applications in their lessons, they benefited from Web 2.0-based applications while making assessments and evaluations, and they advised their other colleagues to use them as well.

Çelenk and Tatlı (2022), in their study, investigated the effects of Web 2.0 supported measurement and evaluation tools on the form and structure characteristics of the questions developed by pre-service science, mathematics and social studies teacher candidates. A total of 30 pre-service teachers studying in the 3rd and 4th grades participated in the research. Within the scope of the research, 40 hours of face-to-face training was given to pre-service teachers on the use of Web-based applications such as Kahoot, Quizizz, Testmoz, Quiz Maker, LearningApps, Polldady, which are Web 2.0-based assessment and evaluation applications. Pre-service teachers were asked to produce questions and content related to their fields before the training and to produce questions and content related to their fields after receiving the training. As a result of the study, it was concluded that the types of questions and content produced by the pre-service teachers after the Web 2.0-based training were more qualified.

4. Discussion and Conclusion

Four of the five volunteer science teachers who participated in this research said that these practices had a positive effect on cognitive competence and affective competence, because they wanted to use Kahoot, Socrative, Quizizz and My Quiz, which are Web 2.0 assessment and evaluation tools, because of their features such as assessment, creative

thinking, discussion, brainstorming and creating a competitive environment, attracting attention and attention, repeating the topic, embodying abstract concepts, appealing to multiple intelligences, they want to use Kahoot, Socrative, Quizizz and My Quiz, which are Web 2.0 assessment and evaluation tools, they use technology in this field, they use technology in this field and they are willing to use in-service technology. A general comment can be made that they can easily apply technological applications in their lessons. One of the five volunteer science teachers who participated in the research stated that he had no knowledge about Web 2.0 tools, did not use them in his classes, and did not think to use them, and concluded that he did not have technological competence and was not open to innovation.

In the course process, it was seen that science teachers used at least one of the Web 2.0-based measurement tools Kahoot, Socrative, Quizizz and My Quiz in the stages of attracting attention, motivating, increasing motivation, informing the target, deepening and assessment and evaluation, and the Kahoot application was preferred the most. The reason why Kahoot application is used more than other applications is that it is more effective and remarkable than other measurement tools in creating game-based classroom environments that learn by having fun and realizing permanent learning by structuring knowledge.

This research has revealed that science teachers have knowledge about Web 2.0-based assessment and evaluation tools, but not at a sufficient level. For this purpose, the number of in-service training activities can be increased by the Ministry of National Education through the IBA (Teacher Information Network) or face-to-face during breaks, in-service seminars at the beginning of the semester and in-service seminars at the end of the semester, in order to improve the technology use levels of teachers, to increase their knowledge level about Web 2.0-based assessment and evaluation tools and to raise awareness.

5. Recommendations

Only qualitative data were used in this study. The phenomenology design, which is one of the qualitative research methods, was used in the research. Study survey vs. can be applied to quantitative research.

Scientific Ethics Declaration

The author declares that the scientific ethical and legal responsibility of this article published in EJES journal belongs to the author.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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