International Journal of Contemporary Educational Research (IJCER)

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Article History
Received: 15.06.2023
Received in revised form: 21.08.2023
Accepted: 29.08.2023
Article Type: Research Article

To cite this article:

Süğümlü, Ü. (2023). Developing digital content production skills for mother tongue teaching with Web 2.0 tools in teacher education: An action research. *International Journal of Contemporary Educational Research*, *10*(3), 687-701. https://doi.org/10.52380/ijcer.2023.10.3.481

International Journal of Contemporary Educational Research
Volume 10, Number 3, September 2023, Page 687-701 ISSN: 2148-3868

Developing Digital Content Production Skills for Mother Tongue Teaching with Web 2.0 Tools in Teacher Education: An Action Research

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Abstract

Today, it is widely acknowledged that the use of the Internet and the development, production, and sharing of content over the web have become widespread. Web technologies that provide these conveniences are commonly referred to as Web 2.0 tools. This study aims to develop the skills of pre-service teachers who will teach Turkish as a mother tongue to produce digital content for mother tongue teaching with Web 2.0 tools. The research was conducted using action research, one of the qualitative research methods. The participants developed their digital content production skills through the research using many different Web 2.0 tools. With these different Web 2.0 tools, the participants developed instructional content such as puzzles, online quizzes, presentations, video preparation and editing, blogs and websites, and concept maps. The various digital contents developed by the participants with different Web 2.0 tools are digital teaching materials for reading, writing, listening, watching, and speaking skills that form the basis of mother tongue teaching. The participants' thoughts about feeling inadequate about Web 2.0 tools before the implementation changed after the implementation. The participants could produce content with Web 2.0 tools, improve their teaching skills, and benefit from these tools in their teaching practicum.

Keywords: Web 2.0 tools, teacher education, digital skills, teaching Turkish as a mother tongue, action research

Introduction

It is a known fact that digital technologies are taking more and more place in people's lives. Education systems have also been affected by technological developments. As a result of this influence, the technologies used in the field of education have been conceptualized as instructional technologies and evolved into web-based teaching with the widespread use of the internet. Today, it is known that internet use and, accordingly, the development, production, and sharing of content on the web have become widespread.

The development of web technologies is evaluated in five categories: Web 1.0, Web 2.0, Web 3.0, Web 4.0, and Web 5.0 (Rani, Das, & Bhardwaj, 2022). Today, one of the most important teaching elements based on web technologies are web 2.0 tools. The term Web 2.0, first used by Tim O'Reilly in 2004, has emerged as a communication-based system where users can not only obtain information but also create and share information (Conole & Alevizou, 2010; Akman, 2022). Since 2004, various Web 2.0 technologies have been rapidly gaining prevalence in people's daily lives (Luo, 2013).

Web 2.0 technologies have changed the habits of using the Internet. With Web 2.0 tools, the Internet has ceased to be an environment where information is prepared and transmitted, and ready-made information is consumed. It has become a platform where content is produced, shared, combined, and transferred among the participants (Horzum, 2010). With these features, Web 2.0 technologies are defined as technologies that enable users to produce and share content and work in collaboration with other users (Franklin & Van Harmelen, 2007). Web 2.0 tools represent the second generation of web pages that facilitate communication, provide secure content, and enable online collaboration (Alexander, 2006). These tools offer opportunities such as communication, interaction, information sharing, easy access to information, collaborative content creation, content storage and sharing, evaluation, and visualization in a simple and easy way for all levels of participants (Ajjan & Hartshorne, 2008).

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Elmas and Geban (2012) grouped Web 2.0 tools as content management systems, online meetings, online storage and file sharing, online surveys, concept map and drawing tools, animation and video, word clouds, and interactive presentations. In terms of purposes of use, Web 2.0 tools include classroom management, organizing meetings and conferences, discussion (synchronous and asynchronous), creating concept maps and flowcharts, creating graphics (posters, infographics, cartoons, and maps), creating videos, interactive videos, and animations, creating digital stories, creating e-books and z-books, creating surveys, tests, and puzzles, assessment and evaluation, virtual reality and augmented reality tools, presentation tools, building websites and blogs, file sharing, creating online collaborative workspaces, and 3D modeling (Akman, 2022). The areas of use of Web 2.0 tools and the conveniences they provide are also helpful for education. In terms of usage areas, it can be said that Web 2.0 tools offer many options and conveniences for teachers and students to prepare, share, and use content because Web 2.0 tools support learning thanks to their accessible, personal, and portable features in terms of time and space (Cheung & Hew, 2009). These applications provide students with new environments for inquiry-based and exploratory learning (Conole & Alevizou, 2010), as well as learning environments that enable students to be collaborative and active beyond traditional learning environments (Clements & Boyle, 2018). Luo (2013) states that the benefits of Web 2.0 tools for learning are that they promote affective learning, enhance collaborative learning, foster a learning community, increase learning performance, and support metacognitive learning. With these features, Web 2.0 tools can be utilized in teaching different courses (Rich, 2008). Balbay and Erkan (2018) state that Web 2.0 tools support students' autonomous learning in language teaching, so autonomous learning skills can be developed using these tools.

There are many studies on the use of Web 2.0 tools for pre-service teachers, teachers, and students (Almalı & Yeşiltaş, 2020; Conole & Alevizou, 2010; Coutinho, 2008; Girgin, 2011; Sadaf, Newby, & Ertmer, 2012; Süğümlü & Aslan, 2022; Yıldırım, 2020). These studies contribute to the quality of learning and teaching processes by guiding both teachers and students to improve their digital skills. In this framework, it is important for future teachers and teachers to know and use Web 2.0 tools in their lessons because one of the competencies expected from future teachers and teachers is to have digital skills. These skills should be provided to future teachers in teacher education.

UNESCO (2008), in its "Information and Communication Technologies Competency Framework for Teachers" report, states that individuals should be prepared to acquire skills such as using information technologies, searching, analyzing, and evaluating information, problem-solving and decision-making, and creative and effective use of productivity tools. Educational institutions and teachers are responsible for preparing individuals for life with these skills. The European Commission (2010), in its report "The Future of Learning: Visions of European Teachers," states that technology will be an integral part of learning and that teachers will be lifelong learners. As the most important resource in schools, teachers are critical to raising educational standards. To a large extent, improving education efficiency and equity depends on ensuring that teachers are highly skilled, well-resourced, and motivated to do their best (OECD, 2009).

One of the skills that teachers should possess is digital competence. In the 2023 Education Vision Document, the Ministry of National Education (MoNE, 2018) states that future teachers should have a culture of using and developing digital content effectively. In addition, effective use of information and communication technologies has been identified as a teacher competency criterion in the Framework of General Teacher Competencies (MoNE, 2017). Digital competence is included among the critical competencies in curricula, and digital competence is associated with the use of computers, information communication technologies, and the internet (Bağcı Ayrancı & Süğümlü, 2021; MoNE, 2019). In its "Teacher Competencies" report, the Turkish Education Association (2009) states that a maximum of 5% of teachers can be trained each year with the current in-service training budget. With the same budget, all teachers can create and access an interactive web-based training model. When all of these are evaluated, it becomes clear that pre-service teachers in teacher education should be familiar with internet-based technologies and trained with the skills to use them effectively in the teaching process. This means that Web 2.0 technologies should be learned by teachers and future teachers and used in their teaching processes. Using these web tools, especially in core areas such as language teaching, should be seen as as important as supporting other teaching areas.

Today, it is essential for the education system to guide individuals to utilize digital technologies safely and correctly (Hague & Payton, 2010). The person who will provide this guidance in the education system is the teacher. In this case, it is necessary to provide teacher training to utilize digital technologies in the course teaching processes and to include students in the learning process with Web 2.0 tools. Karakuş and Er (2021), in a study conducted with pre-service Turkish teachers in Turkey, determined that Web 2.0 tools are not well known by future teachers and emphasized the importance of conducting studies on this subject. Ajjan and

Hartshorne (2008) stated in their study that although the lecturers who teach at the faculty think that Web 2.0 tools are useful for teaching and learning, very few use them in the classroom. Another study determined that language instructors' attitudes towards these tools increased at the end of training on using Web 2.0 tools (Balbay & Erkan, 2018). Another study shows that students (digital natives) in foreign language learning use Web 2.0 tools frequently and are assertive and practical in producing content and sharing it through links (Bozna & Yüzer, 2020). Considering the opportunities offered by Web 2.0 tools and applications for students and teachers, it is vital to conduct research based on experiences to improve teachers' and students' skills in using these tools. For this reason, the knowledge and effective use of Web 2.0 tools by native and foreign language teachers will support students' language and cognitive skills.

Mother tongue helps children develop high levels of creativity and sensitivity (Ofosu, Mahama, Vandyck, Kumador, & Toku, 2015). Teaching Turkish as a mother tongue is a multifaceted field that aims to develop both language and mental skills. The development of students' language and cognitive skills also supports the development of their skills in other courses. In the development of language and mental skills, there is a need to use interactive and versatile digital tools. For this reason, it is important to develop the skills of preservice Turkish teachers, who will be the future Turkish teachers, to produce digital content with Web 2.0 tools for Turkish lessons. When the materials used in teaching Turkish as a mother tongue are examined, it is seen that digital contents are more than printed contents (Tekşan & Çinpolat, 2021). For this reason, knowing and using Web 2.0 tools and preparing teaching content have an important place in digital content production. The use of many Web 2.0 tools by Turkish teachers in the context of teaching strategies, methods, and techniques will increase the quality of teaching Turkish as a mother tongue (Süğümlü & Tekşan, 2022).

As a result of the literature review, the reasons for conducting the research are that there is no applied research on developing digital content related to mother tongue teaching with Web 2.0 tools in teacher education in Turkey and that the researcher observed that the digital content production skills for mother tongue teaching of the Turkish teachers were not sufficient during the teaching process and in the different courses they gave for mother tongue teaching for five years at the university where they worked for the pre-service Turkish teachers. It is thought that this study will contribute to the use of technology in education among teachers who teach mother tongue, pre-service teachers, instructors, and graduate students who study the use of technology in education. In addition to these, this study will also contribute to the training of the participants as individuals who can easily adapt to technology and use new technologies effectively in their professional lives after they become teachers. In this context, the research aims to improve the skills of pre-service Turkish teachers to produce digital content for Turkish language courses with Web 2.0 tools. In the context of this main purpose of the research, answers to the following research questions were sought:

- Which Web 2.0 tools did the participants use to produce digital content?
- Which digital content did the participants produce with Web 2.0 tools?
- Which language skills and topics did the participants' digital content address?
- What are the participants' opinions about producing digital content with Web 2.0 tools before and after the application?
- Did the application increase the participants' competencies in using Web 2.0 tools?

Method

Research Design

The research was conducted using action research, one of the qualitative research methods. Action research involves process-based research. In this process, data are collected and analyzed systematically, and the analyzed data are presented as feedback to the participants. Thus, action plans are systematically developed (Derince & Özgen, 2017). Action research is a process in which positive change is targeted through qualitative methods to understand the effects of educational interventions made by teachers and administrators on students in schools and classrooms (Mills, 2003). In the action research process, problem determination, data collection, data analysis, determining an action plan, realizing the action, and deciding on an alternative or new action (Yıldırım & Şimşek, 2013). The researcher aimed to develop the participants' digital content production skills needed in the teaching process in a real school environment based on the problem situation he determined. The action plan prepared for this purpose is shown in Figure 1.

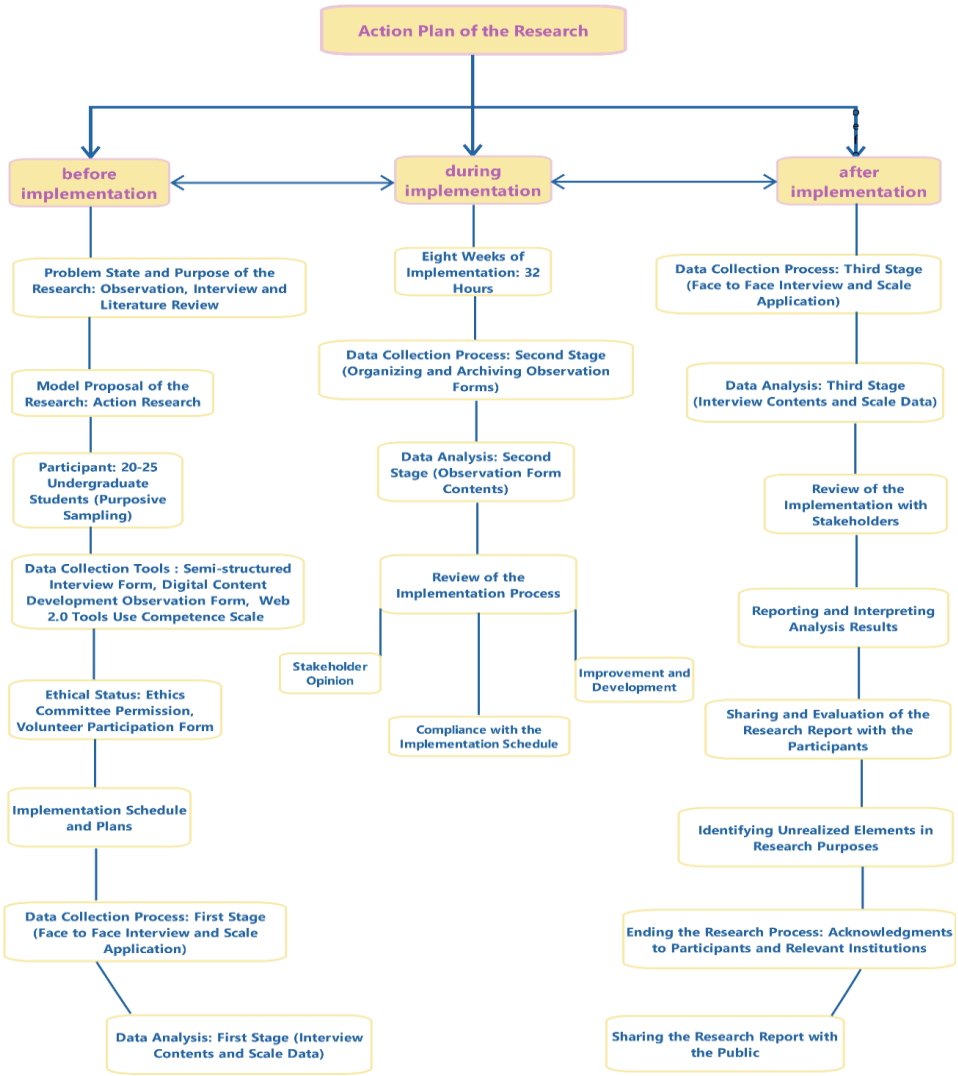

Figure 1. Action Plan of the Research

Participants

The participants of the study consisted of 21 students who were selected according to the principle of volunteerism and the sampling method of the study among the senior students studying in the Department of Turkish Language Teaching in the Faculty of Education at a state university in the spring semester of the 2021–2022 academic year. Purposive sampling, one of the non-probability sampling methods, was used to determine the participants of the study. To better serve the purpose of the study, the participants were selected among those who had not used Web 2.0 tools before and who considered themselves inadequate in preparing digital content. 11 (52.4%) of the participants were female, and 10 (47.6%) were male pre-service teachers. Participants were coded as P1, P2, P3,... P21.

Data Collection Tools

Creswell (2017) states the types of data collection in qualitative research as observation, interview, document, and audio-visual materials. The study used a semi-structured interview form developed by the researcher and Digital Content Development Observation Form as qualitative measurement tools. However, qualitative and quantitative data are used together in action research to provide data diversity (Creswell, 2012; Johnson, 2005). In this framework, the Web 2.0 Tools Use Competence Scale (Çelik, 2020) was also used to provide data diversity. The data collection tools used in the study and the relationship between these tools and the research questions are shown in Figure 2.

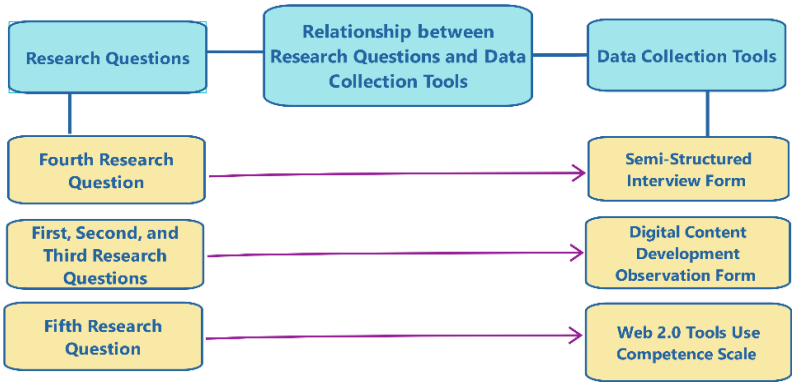

Figure 2. Relationship between research questions and data collection tools

Before using the semi-structured interview form, one of the data collection tools of the research, a validity study was conducted to determine whether the questions in the form were adequately related to the research purpose and questions. Within the scope of the validity study, the opinions of three field experts were taken, and the interview form was finalized by editing the questions in line with the opinions received. After the Digital Development Observation Form, another data collection tool for the research was prepared; it was shown to three field experts for its suitability to the research purpose and questions, and the observation form was finalized in line with the opinions of the field experts. The Digital Content Development Observation Form consists of two parts. The first part includes the language skills and topics related to the developed digital content; the second part includes the Web 2.0 tool used in creating the developed digital content, the content development process, and the visuals of the developed content.

To ensure the inclusion of a diverse range of data in the study, the Web 2.0 Tools Use Competence Scale developed by Çelik (2020) was used as a quantitative data collection tool. The scale, which was designed to determine the competence of teachers and pre-service teachers in using Web 2.0 tools, was prepared in a five-point Likert type. The five-point scale is stated as follows: never (1), rarely (2), sometimes (3), frequently (4), and always (5). Exploratory Factor Analysis, Confirmatory Factor Analysis, item analysis, Total Item Correlation, and Cronbach Alpha tests were applied in the scale development process. The Cronbach's Alpha reliability coefficient of the scale was found to be .98. After the validity and reliability analyses, it was stated that the scale, which was prepared with 50 items, was a valid and reliable scale with 39 items and a unidimensional structure.

Data Collection

The implementation of the study was completed in eight weeks. Data were collected in three stages: before, during, and after the implementation. Interviews with the participants for the questions in the semi-structured interview form, one of the data collection tools of the research, were conducted in two stages. In the first stage, face-to-face interviews were conducted with the participants before the start of the training. In the first interview, the researcher asked the participants about their views about using Web 2.0 tools and their expectations from the research.

In this way, it was aimed at reflecting the thoughts and expectations of the participants in the research process. In the second stage, after completing the eight-week implementation process, the participants were re-interviewed face-to-face. In the last interview, the participants were asked about their thoughts on developing digital content with Web 2.0 tools. Thus, it was tried to determine how the participants' learning experiences were reflected in their thoughts. Finally, with the Digital Content Development Observation Form, another data collection tool for the research, the studies for each application of the research were reported after the research process started. Reporting was done separately for each participant. The researcher made observations as a participant. To ensure data diversity in the study, the Web 2.0 Tools Use Competence Scale was applied to determine the participants' use of Web 2.0 tools before starting the applications. The same scale was reapplied to the participants at the end of the application. Thus, it was tried to determine whether there was an improvement in the participants' competencies in using Web 2.0 tools. Thus, data were collected with three data collection tools in accordance with the research action plan, and the data collection process was finalized. The data collection process for the research is shown in Figure 3.

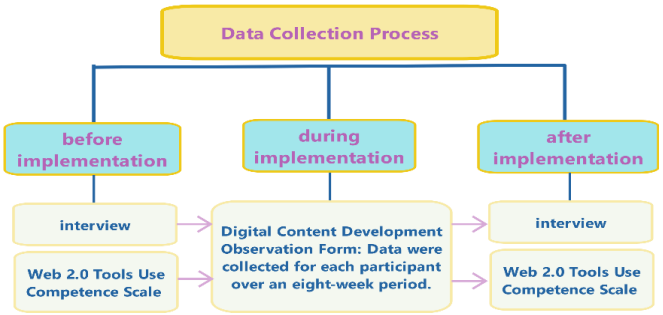

Figure 3. Data collection process

Data Analysis

Two types of analysis were conducted in the research. First, content analysis was used for qualitative data, and descriptive analysis was used for quantitative data. Categorical content analysis, one of the types of content analysis, was used to analyze qualitative data. Categorical content analysis, one of the types of content analysis, was used to analyze qualitative data. In categorical analysis, data are first coded, categories are created and organized, and in the last stage, the findings obtained are defined and interpreted (Robson, 2017). The study's qualitative data were transferred to the MAXQDA 20 qualitative data analysis program, and analysis procedures were carried out through the program. Within the framework of content analysis, firstly, coding was done separately, and themes were formed by combining these codes. After the coding was done, the agreement between the codes was checked. There was no discrepancy between the codings performed by the researcher based on the code-recode technique. In addition, in the study, direct transfer statements for the codes were included to ensure the reliability of the data analysis. Finally, the data analysis findings were presented with visuals obtained from the program. In addition, the frequency of each code was included in the visuals. The fact that the lines between the theme and the codes in the visuals are thick or thin indicates the intensity or redundancy of the participant's expressions in the relevant code. In the descriptive analysis of quantitative data, one of the most general procedures is to calculate the measures of central tendency (Kilmen, 2022). The mean scores of the participants' competence in using Web tools were calculated before and after the application. The results of the description of the data are shown in the table. The participants' mean scores before and after the implementation were evaluated according to the statements never, rarely, sometimes, frequently, and always.

Research Ethics

Ethical elements were complied with in the research process. Participants attended the research according to the principle of voluntariness. The entire research process was explained to the participants, and it was stated that they could leave the study at any time during the process. No personal information was used in the research, and codes were given to the participants. The entire research process was carried out according to the codes. The information about the institution where the research was conducted was also kept confidential, and the institution's name was not included in the research report. Therefore, the necessary ethical approval was obtained from the relevant institution's Social and Human Sciences Research Ethics Committee (Ordu University, 30.03.2022, 2022–40) for the research.

Results

Web 2.0 Tools Used to Produce Digital Content

The codes that emerged in the theme of Web 2.0 tools used to produce digital content during the implementation and the frequency of these codes are shown in Figure 4.

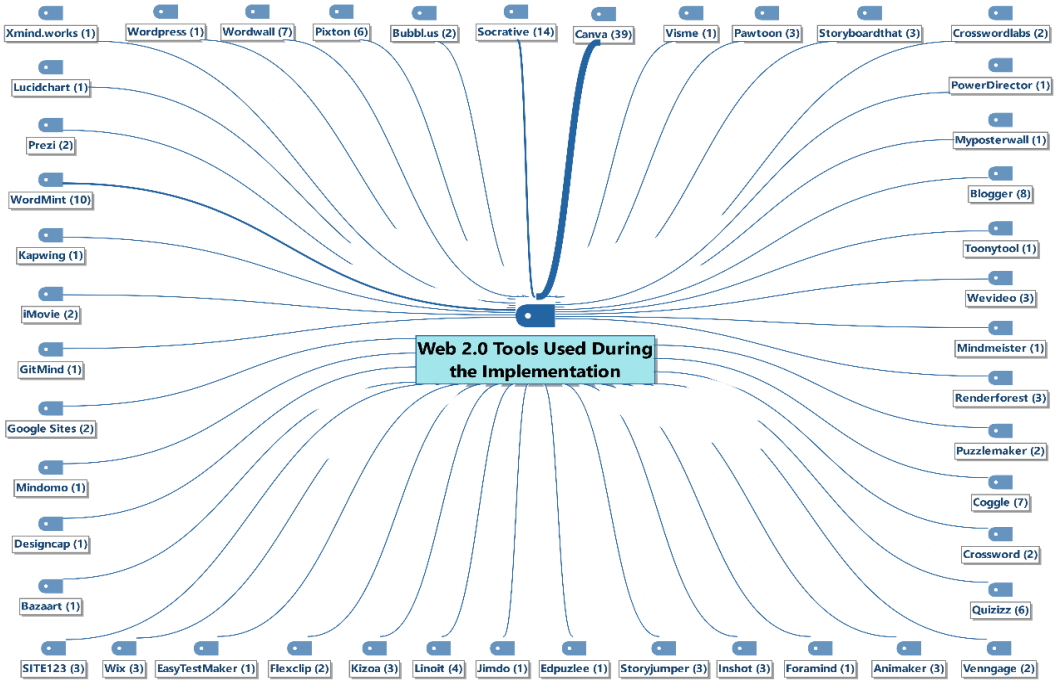

Figure 4. Web 2.0 tools used during the implementation

Figure 4 shows that the participants used Lucidchart, Kapwing, iMovie, GitMind, Wordpress, Mindomo, Google Sites, Bazaart, Designcap, Wix, Flexclip, EasyTestMaker, Kizoa, Linoit, Jimdo, Edpuzlee, Visme, Storyjumper, SITE123, Xmind.works, WordMint, Pawtoon, Storyboardthat, Crosswordlabs, Myposterwall, Inshot, Foramind, Animaker, Venngage, Quizizz, Crossword, Coggle, Puzzlemaker, Renderforest, Mindmeister, Wevideo, Toonytool, Blogger, PowerDirector, Prezi, Canva, Socrative, Bubbl.us, Pixton, and Wordwall Web 2.0 tools. The participants used 46 different Web 2.0 tools during the implementation and mainly used *Canva* (39), *Socrative* (14), and *WordMint* (10) Web 2.0 tools to produce digital content. These findings show that the participants learned many different Web 2.0 tools during the implementation and developed their skills in creating digital content with these tools.

Types of Digital Content Produced with Web 2.0 Tools

The codes that emerged in the theme of digital content types produced for mother tongue teaching with Web 2.0 tools during the implementation, the frequency of the codes, and the participants in the codes are shown in Figure 5.

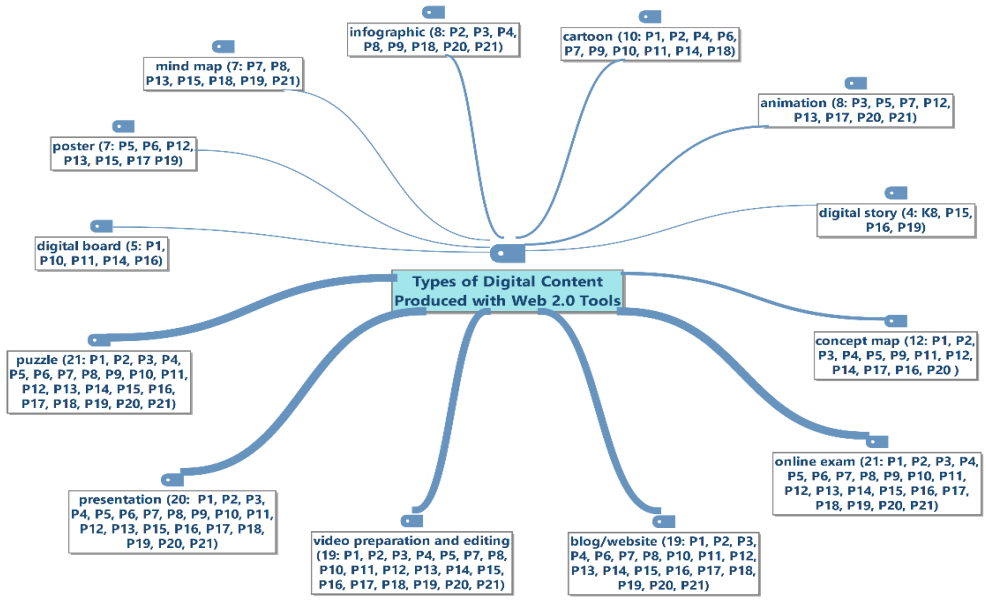

Figure 5. Types of digital content produced with Web 2.0 tools

As is shown in Figure 5, the codes in the theme of digital content types for mother tongue teaching produced with Web 2.0 tools during the application are infographic, cartoon, animation, digital story, concept map, mind map, online exam, blog or website, video preparation and editing, presentation, puzzle, digital board, and poster. In addition, participants were able to develop instructional content for mother tongue teaching in 13 different types of digital content during the implementation. Among these content types, puzzles (21), online quizzes (21), presentations (20), video preparation and editing (19), blogs and websites (19), and concept maps (12) were produced the most. These findings show that the participants could produce different digital content for mother tongue teaching with Web 2.0 tools during the implementation. In addition, the application contributed to the development of the participants' animated-motionless visual design skills, interactive-non-interactive content production skills, and digital sharing skills.

Language Skills and Topics Related to the Digital Content Produced

Figure 6 shows the codes that emerged in the theme of language skills and topics related to the digital content produced for mother tongue teaching with web 2.0 tools during the implementation and the frequency of these codes.

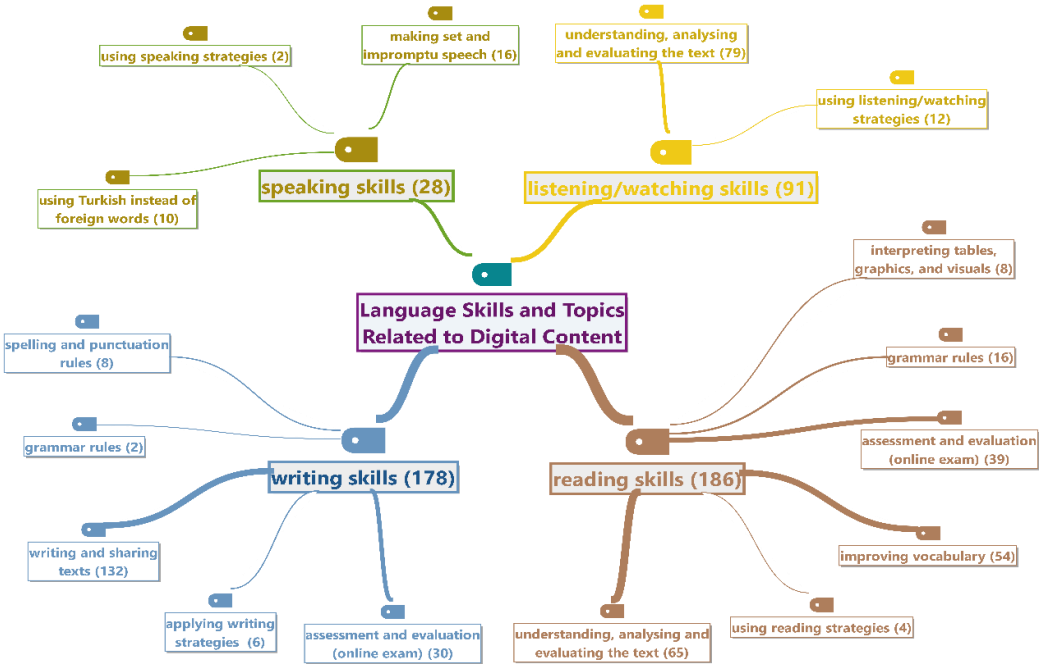

Figure 6. Language skills and topics related to digital content

As is shown in Figure 6, the digital contents produced by the participants for mother tongue teaching with Web 2.0 tools during the implementation period emerged in the codes of reading skills, writing skills, listening/watching skills, and speaking skills. In addition, most digital content was developed for reading (186) and writing skills (178). The digital contents developed for reading skills were as follows: understanding, analyzing, and evaluating the text; assessment and evaluation (an online exam); improving vocabulary and grammar rules; interpreting tables, graphics, and visuals; and using reading strategies. Most digital content for reading skills was produced in the sub-code of understanding, analyzing, and evaluating the text (65). The digital contents developed for writing skills include writing and sharing texts, assessment and evaluation (an online exam), spelling and punctuation rules, applying writing strategies, and grammar rules. Most digital content for writing skills was produced under the sub-code of writing and sharing texts (132). The digital content developed for listening and watching skills included understanding, analyzing, and evaluating the text, as well as using listening and watching strategies. Most digital content for listening and viewing skills was produced in the sub-code of understanding, analyzing, and evaluating the text (79). The digital contents developed for speaking skills were making set and impromptu speeches, using Turkish instead of foreign words, and using speaking strategies. Most digital content for speaking skills was produced under the sub-code of making set and impromptu speeches (16). These findings show that the participants were able to develop digital content for teaching four basic language skills during the implementation.

Opinions Before and After Implementation

The codes that emerged from the participant's views on digital content development with Web 2.0 tools before and after the implementation are shown in Figure 7.

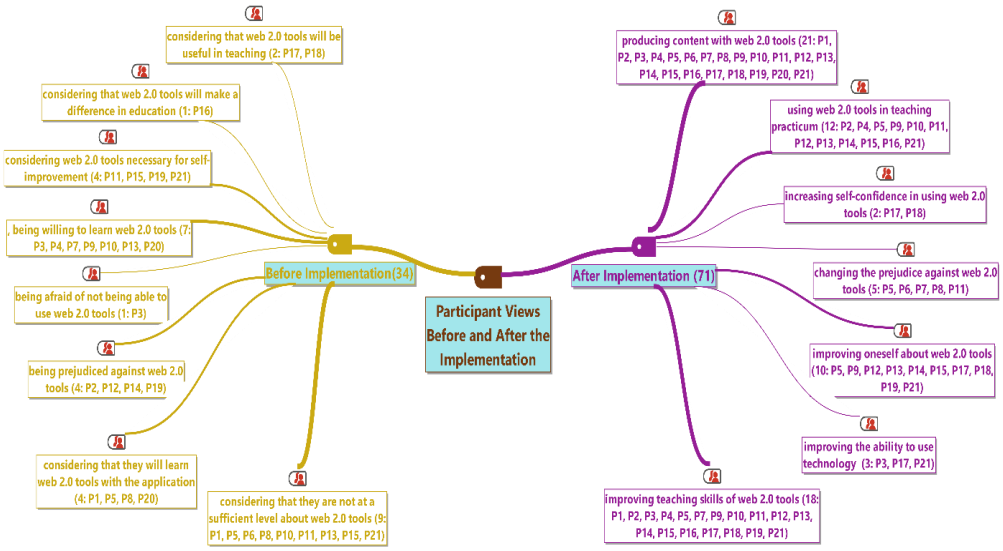

Figure 7. Participant views before and after the implementation

Figure 7 shows that the participant's views on developing digital content with Web 2.0 tools before the application are gathered under the codes of considering that Web 2.0 tools will be useful in teaching, considering that Web 2.0 tools will make a difference in education, considering Web 2.0 tools necessary for self-improvement, being willing to learn Web 2.0 tools, being afraid of not being able to use Web 2.0 tools, being prejudiced against Web 2.0 tools, considering that they will learn Web 2.0 tools with the application, and considering that they are not at a sufficient level about Web 2.0 tools. Similarly, when Figure 7 is examined, it is seen that the participant's views on developing digital content with Web 2.0 tools after the implementation are gathered under the codes of producing content with Web 2.0 tools, using Web 2.0 tools in teaching practicum, increasing self-confidence in using Web 2.0 tools, changing the prejudice against Web 2.0 tools, improving oneself about Web 2.0 tools, improving the ability to use technology, and improving the teaching skills of Web 2.0 tools. Before the implementation, the participants mostly expressed their opinions on the codes, considering that they were not at a sufficient level about Web 2.0 tools and were not willing to learn Web 2.0 tools; after the implementation, the participants mostly expressed their opinions on the codes of producing content with web 2.0 tools, improving teaching skills with Web 2.0 tools, and using Web 2.0 tools in teaching practicum. These findings obtained from the participants' opinions before and after the application indicate that they learned to use Web 2.0 tools, transformed them into teaching skills, created awareness about using Web 2.0 tools, and developed self-confidence by eliminating their prejudices.

In the interview conducted before the application, participant code P13 stated that he was not at a sufficient level regarding Web 2.0 tools with the opinion, "*My ability to use digital content platforms is almost non-existent.* The participant P21 responded in a similar way: "*I still feel incomplete in this regard.*" Participant P11 said, "*I am not very good with technology; I need to improve myself. Web 2.0 tools will be a steppingstone for me*," and s/he expressed her expectations from the applications to consider Web 2.0 tools necessary for self-improvement. In the post-implementation interview, participant P2 said, "*The practices we have done will contribute to our teaching life. In the teaching practicum, I made the lessons more remarkable by preparing activities and presentations for our students with these contents. I had the opportunity to improve myself in the digital environment with the skills it added to me during the practice.*" He stated that he could use Web 2.0 tools in his or her teaching practicum. Participant P17 said, "*Before the application, I did not know much about Web 2.0 tools. However, with these applications, I liked having knowledge and designing activities, and I felt I improved myself. I cannot explain the excitement I experienced, especially in preparing my first animation. I still open it from time to time and watch that video. I prepared my work after those efforts very sincerely and regularly. These applications have added a lot to me digitally*," and she expressed that she has improved herself in Web 2.0 tools.

Development of Competence in the Use of Web 2.0 Tools through Implementation

The mean scores obtained from the Web 2.0 Tools Use Competence Scale, administered as a pre-test and post-test to determine the participants' competencies in using Web 2.0 tools, are shown in Table 1.

Table 1. Participants' pre-test and post-test score averages

Test	Average	Level of Participation
pre-test	2.41	rarely (2)
post-test	4.60	always (5)

Table 1 shows that the mean pre-test score of the participants for their competencies in using Web 2.0 tools was 2.41, and the mean post-test score was 4.60. While the mean score of the participants' competence in using Web 2.0 tools before the application was determined to be rare, it was defined as always after the application. This finding can be interpreted as an improvement in the participants' competencies in using Web 2.0 tools.

Discussion and Conclusion

Discussion

It is presently well established in the literature that online learning resources have become more widespread than printed textbooks (Karcmer-Klein & Shinas, 2012; Estable, 2018). New technological systems and tools are rapidly spreading in parallel with the development of educational technology and are used to benefit educational activities (Joo, Bong, & Choi, 2000). Peregoy and Boyle (2012) stated that students' motivation increases when they encounter new teaching material other than books in the classroom environment. Teachers are also expected to create multiple learning environments in their lesson processes, to benefit from digital technology elements, and to use and make them use these elements regularly in the process (Yazar, 2019) because using digital technology is beneficial in terms of optimizing the materials used in the lessons and arousing interest (Özdemir, 2021). Determining which Web 2.0 tools will be used for the content of the teaching and having knowledge about how they can be used serves the principle of "integrating the content to be taught with technology," which is among the teacher competencies (Kanık-Uysal & Çinpolat, 2022). This study is aimed at developing the skills of pre-service teachers who will teach Turkish as a mother tongue to produce digital content with Web 2.0 tools. Thus, it is expected that those who will become teachers and teach Turkish as a mother tongue will transfer their skills in using Web 2.0 tools to the classroom environment and involve students in the process.

The first finding of the study is related to which Web 2.0 tools the participants were able to use during the implementation process. During the implementation, the participants used 46 different Web 2.0 tools. Among these tools, Canva, Socrative, and WordMint Web 2.0 tools were mainly used to produce digital content. Thus, the participants developed their skills in creating digital content with these tools. Teachers and instructors use Web 2.0 tools to teach Turkish as a mother tongue (Süğümlü & Aslan, 2022) and as a foreign language (Aytan & Ayhan, 2018). Yaşar-Sağlık and Yıldız (2021) stated that studies on the use of Web 2.0 tools in language teaching have increased in the last five years. Web 2.0 tools have improved reading, writing, listening, and speaking skills in both Turkish and foreign language teaching. Canva, which is the most used Web 2.0 tool by the participants, can be used to concretize abstract concepts, motivate students, attract attention, repeat information, remind prior knowledge, and realize learning effectively (Smaldino, Lowther, & Mims, 2015). Socrative, another Web 2.0 tool most frequently used by the participants, can be used functionally to ensure students' participation in assessment and evaluation processes. For example, the study conducted by Wash (2014) stated that student participation was higher in cases where responses were given using technology in the classroom. WordMint, the participants' third-most-used Web 2.0 tool, can be used to design fun puzzle activities. Other Web 2.0 tools used during the implementation can also be used for teaching purposes in several aspects. Kahoot and similar web applications increase student participation and contribute to the development of learning (Siau, Sheng, & Nah, 2006). Unlike many presentation tools, Prezi allows working on and accessing presentations online (Perron & Stearns, 2010). The Kahoot application creates assessment tools such as multiple-choice questions, questionnaires, and true and false (Tıraşoğlu, 2019). Gursoy and Goksun (2019), in their study with pre-service science teachers, stated that pre-service teachers developed content using Web 2.0 tools such as Kahoot, Quizizz, Powtoon, Emaze, MindMeister, and Toondoo during the application and shared the content with the class using Edmodo.

The study's second finding is related to the types of digital content for mother tongue teaching that the participants could develop using Web 2.0 tools during the implementation process. During the implementation,

the participants were able to create teaching content for mother tongue teaching in 13 different types of digital content. Among these content types, puzzles, online quizzes, presentations, video preparation and editing, blogs and websites, and concept maps were the most common. The participants could produce different digital content for mother tongue teaching with Web 2.0 tools and developed their skills in animated-motionless visual design, interactive-non-interactive content production, and digital sharing. Web 2.0 tools provide environments that enable teachers to prepare versatile content they can use in their lessons. Participants benefited from the opportunities that Web 2.0 tools offered during the implementation. In her research, Coutinho (2008) concluded that Web 2.0 tools are versatile tools for pedagogical purposes and for blogging to create effective learning environments. In addition, concept maps created with Web 2.0 tools can be used as teaching tools that organize and present concepts, sub-concepts, and relationships between concepts (Novak & Canas, 2007). Bhattacharya and Mohalik (2020) stated that digital mind-mapping applications enable students to participate directly in learning. Luo (2013) states that activities designed with Web 2.0 tools can help students develop essential skills, especially language learning skills such as communication, collaboration, and problem-solving, critical skills needed in the 21st century. Developing different types of content with Web 2.0 tools that can produce educationally beneficial content is possible. The participants created different types of content during the implementation and developed their digital content production skills.

The third finding of the study is related to the language skills and topics of the digital content that the participants developed for mother-tongue teaching using Web 2.0 tools during the implementation process. During the implementation, the participants developed content for reading, writing, listening/watching, and speaking skills for mother tongue teaching with Web 2.0 tools. Most digital content was developed for reading and writing skills. The most digital content for reading skills is for understanding, analyzing, and evaluating the text; the most digital content for writing skills is for writing and sharing texts; the most digital content for listening and watching skills is for understanding, analyzing, and evaluating the text; and the most digital content for speaking skills is for making set and impromptu speeches. The topics related to the developed digital contents overlap with the topics in the Turkish as a mother tongue curriculum (MoNE, 2019). Mayer (2014) states that technology contributes to the development of literacy and language skills. In terms of technology use, Web 2.0 tools contribute to language learners' development of speaking, writing, listening, and reading skills (Morgan, 2012). Furthermore, these tools provide an environment for users to write, send, and interact over the web (Balbay & Erkan, 2018). Shin (2006) states that synchronous or asynchronous communication is very effective in language learning. Orehovacki, Bubas, and Konecki (2009) stated that students are no longer recipients of knowledge through Web 2.0 technologies but co-creators of knowledge through exchanging information and experience. This requires future teachers to have the skills to integrate Web 2.0 technologies into their lessons. The findings of this study show that Web 2.0 tools can be integrated into mother-tongue teaching.

The fourth finding of the study is related to the participants' views on producing digital content with Web 2.0 tools before and after the implementation. Before the implementation, the participants mostly considered that they were not at a sufficient level regarding Web 2.0 tools. After the implementation, they mostly stated that they could produce content with Web 2.0 tools, that Web 2.0 tools improved their teaching skills, and that they benefited from Web 2.0 tools in their teaching practicum. With the practice, the participants learned to use Web 2.0 tools, converted them into teaching skills, created awareness about using Web 2.0 tools, and developed self-confidence in using Web 2.0 tools.

The fifth finding of the study is that the participants' competence averages in using Web 2.0 tools, which were low before the application, increased at the end of the application. The participants' views and the study's findings on the competence of using Web 2.0 tools overlap. Sadaf, Newby, and Ertmer (2012) concluded in their research that it is important for pre-service teachers to develop positive attitudes towards these tools and their perceptions of the usefulness of these tools in their intention to use Web 2.0 technologies in classroom environments in the future. Another study determined that pre-service science teachers were happy to participate in content development with Web 2.0 tools, learned ways to integrate technology into their fields, and had fun while developing content (Gursoy & Goksun, 2019). Tu, Blocher, and Roberts (2006) stated that training pre-service teachers to gain high Web 2.0 tool self-efficacy perceptions will support future students in acquiring 21st-century skills.

Conclusion

The participants developed their digital content production skills through the research using many different Web 2.0 tools. With these Web 2.0 tools, participants developed instructional content such as puzzles, online quizzes, presentations, video preparation and editing, blogs and websites, and concept maps. Thus, the participants

developed animated-motionless visual design, interactive-non-interactive content production, and digital sharing skills for mother tongue teaching with Web 2.0 tools. The various digital contents created by the participants with different Web 2.0 tools are digital teaching materials for reading, writing, listening, watching, and speaking skills that form the basis of mother tongue teaching. In addition, most digital content was developed for reading and writing skills. The participants' opinions about feeling inadequate about Web 2.0 tools before the implementation changed after the implementation. The participants could produce content with Web 2.0 tools, improve their teaching skills with these tools, and benefit from them in their teaching practicum. Participants' self-confidence in using Web 2.0 tools also increased. Likewise, the participants' competencies in using Web 2.0 tools increased with the application.

Limitations of the Study and Suggestions for Future Research

This research was conducted within the framework of action research, one of the qualitative research designs. The results obtained through the study are limited to the participant group and the data collection tools used in the analysis. Different results may emerge with varying groups of participants and data collection tools. For this reason, conducting further research on this subject will be helpful for the more qualified training of pre-service teachers who will teach the mother tongue In this framework, various suggestions have been developed for future research:

- The research revealed that many Web 2.0 tools could be used in mother-tongue teaching. In new studies, the usability of Web 2.0 tools not included in this research should be examined in mother-tongue teaching. In addition, guidelines for the use of Web 2.0 tools can also be prepared. Similar studies can be conducted with participant groups that have already become teachers.
- Within the scope of this research, it was seen that different types of digital content could be developed with Web 2.0 tools. These digital materials can be used by pre-service teachers in their teaching practicum and by teachers in their lessons. In addition, pre-service teachers and teachers can also develop different types of digital materials using Web 2.0 tools.
- The digital materials developed in the research were seen as being designed for mother tongue teaching and aimed at the four basic language skills. This means that reading, writing, listening, watching, and speaking skills can be developed with Web 2.0 tools. Teachers can cover topics related to language skills in Turkish lessons with Web 2.0 tools and involve students. They can also ask students to do their work using Web 2.0 tools and share it in the classroom.
- This study's participant group thought they were not competent in Web 2.0 tools before the research. After the application, they stated that their skills in using Web 2.0 tools improved. In future studies, affective elements such as perception, attitude, anxiety, and motivation toward using Web 2.0 tools can be improved. In addition, it can be ensured that pre-service teachers are ready in terms of affective aspects before using these tools in teacher education.

Conflicts of Interest

No potential conflict of interest was reported by the author.

Ethical Approval

Ethical permission (30.03.2022–40) was obtained from the Ordu University Ethics Committee for this research.

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