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Research Article

The Effect of Web 2.0 Tools Training on TPACK, Attitudes, and Teaching Processes of Instructors Teaching Turkish as a Foreign Language

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ABSTRACT

The study investigates the influence of Web 2.0 tools training on instructors and the teaching process. Twenty-three instructors teaching Turkish as a foreign language received six weeks of technopedagogical training. The "Technological Pedagogical Content Knowledge Scale (TPACK)" and the "Attitude Toward Technology Scale" were administered as pre-test and post-tests. The instructors' TPACK competencies improved, while their attitudes remained stable across pre- and post-tests. A semi-structured interview revealed that instructors learned to integrate Web 2.0 tools effectively and wanted to use them as alternative materials. To determine the influence of the training on the teaching process, four instructors voluntarily participated in an observation process. Each instructor was observed for three weeks, totaling twelve weeks. Lessons were video-recorded to analyze how instructors applied their training knowledge and skills in the classroom. Observations showed that the instructors effectively utilized Web 2.0 tools to enhance students' language skills, grammar, and vocabulary.

Acknowledgments

Statement of Publication Ethics This study has been approved by the Gazi University Ethics Committee (December 7, 2021; No. 2021-1163).

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Conflict of Interest None.

Note This study was formed with reference to the doctoral thesis named "A review on the effect of Web 2.0 tools education designed for teaching Turkish as a foreign language within the scope of technopedagogical education on teachers and teaching processes."

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Introduction

At the end of the 20th century, technological advancements reached new heights and expanded into diverse dimensions. The astonishingly rapid progress of technology has significantly impacted the field of education, as well as many other sectors. Technology utilization in education has emerged as a necessity rather than a luxury. For this reason, instructors have turned to technological tools that they can use effectively in their lessons. However, it is not enough for instructors to be familiar with technology alone. Their most important task is to enrich the teaching environment by integrating technology into education so that they can successfully complete the teaching process. Mishra and Koehler (2006) assert that effective technology integration demands a comprehensive approach; rather than confining technology knowledge to separate courses, it should be combined with content knowledge and domain-specific pedagogical methods. The main issues with traditional approaches to technology integration in education are that they: 1) prioritize teaching technology itself rather than using technology as a teaching tool, 2) treat technology separately from the concept of TPACK, 3) fail to recognize the complexities involved in technology integration, and 4) offer generic solutions that do not take specific contexts into account (Mishra & Koehler, 2006). Technopedagogical education generally involves planning, conducting, and evaluating teaching by utilizing TPACK to enhance the effectiveness of the teaching process (Kabakçı, 2011).

Technopedagogical education enables instructors to merge technology with their teaching and subject knowledge during instruction. A survey of the literature indicates that technopedagogical education and the TPACK model are used interchangeably. The components of the TPACK model are given below.

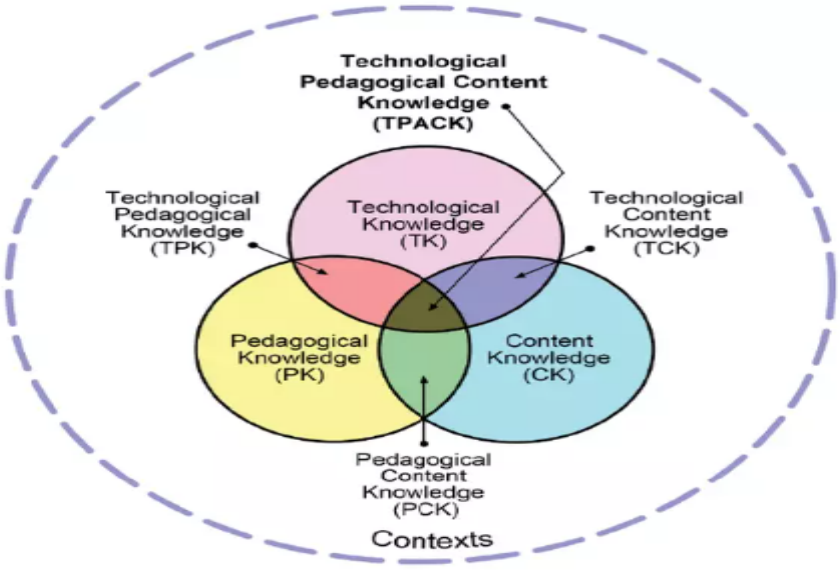


Figure 1. Mishra, P., & Koehler, M. J. (2009). Technological pedagogical content knowledge (TPACK) [diagram] p. 63

Figure 1 illustrates that teachers' knowledge comprises three primary components: content, pedagogy, and technology. Equally significant are the interactions among these

knowledge domains, which are conceptualized as PCK, TCK, TPK, and TPACK (Mishra & Koehler, 2009).

According to Mishra and Koehler (2009), TPACK involves:

1. Comprehending how technology can be used to extend learners' existing knowledge, create new ways of knowing, or reinforce prior understandings.

2. Awareness of students' existing knowledge and learning backgrounds.

3. Insight into what renders specific concepts challenging or straightforward for learners, and how technology can help address these learning difficulties.

4. Pedagogical strategies that effectively integrate technology to teach content in meaningful ways.

5. A foundation for successful technology-enhanced teaching, which involves knowing how to represent concepts through technological tools.

The TPACK model highlights the combination and interplay of three distinct domains, pedagogical, technological, and content knowledge, required for effective integration of technology (Kabakçı-Yurdakul, 2011). Research by Usluel, Mumcu, and Demiraslan (2007) examined the incorporation of information and communication technologies into educational practices. They found that a common issue is that teachers often lack sufficient knowledge and experience in using technology effectively in the classroom. The authors highlighted the importance of in-service training in supporting instructors' lifelong learning. The starting point of this study is that instructor training is structured to integrate technology with pedagogy, rather than focusing solely on traditional technology training. It is believed that this technopedagogical training will benefit both the trainers and the teaching process, and therefore have positive outcomes for students. In this regard, Web 2.0 tools training, which is among the technological tools that can be used effectively at every stage of the teaching process and will provide great convenience to the instructors, was designed.

The swift development of internet technologies has resulted in the rise of Web 2.0 tools, which offer participatory learning experiences and enable the creation of flexible, time- and place-independent learning environments and materials (Çelik, 2020). With these tools, instructors can create effective content and presentations for the relevant courses and share these with large audiences. These tools are comprehensive. Web 2.0 tools have a crucial impact on teaching foreign languages. Numerous studies indicate that Web 2.0 applications have transformed language teaching by providing authentic learning environments that promote communication, collaboration, and deeper learning for learners and instructors alike (Bartolomé, 2008; Boss, 2012; Markham, 2011). According to Chang et al. (2012), Web 2.0 tools allow language learners to interact frequently with various native speakers across different contexts. As a result, it can be concluded that these tools offer learners authentic environments for the language learning process. An important feature of Web 2.0 tools is their application of online social networks to facilitate foreign language learning. Users can collaborate, create, and share content with others, which can enhance the process of learning a foreign language (Lomicka & Lord, 2009). Çiftci and Sağlam (2023) reported that integrating Web 2.0 tools into foreign language instruction enhanced

students' motivation and positively affected their attitudes and perceptions towards technology-based learning. Aşıksoy (2018) found that EFL learners possess positive attitudes towards Web 2.0 tools, as they believe these tools assist them in learning the target language. All these pedagogically supported and fascinating features of Web 2.0 tools have become a necessity to develop and support learning experiences for both learners and instructors in various fields of foreign language learning (Kuznetsova & Soomro, 2019). Web 2.0 tools enable students to plan and monitor their own learning processes; assist them in producing effective content; and ensure their active participation in the learning process. Furthermore, these tools support group work, creating collaborative learning environments. In this context, Web 2.0 tools enhance interaction and collaboration in the foreign language learning process by supporting students' creativity and learner autonomy. Considering all these factors, it can be said that effective use of Web 2.0 tools in the classroom enhances foreign language teaching and benefits both instructors and students. This research focused on Web 2.0 tools, which have demonstrated usability and benefits in education. It investigated the effectiveness of online training designed in a technopedagogical framework for both the instructors and the teaching process.

Aim of the Study

This study aims to examine the effects of online Web 2.0 tools training on instructors of Turkish as a foreign language in terms of various variables and assess how it affects classroom practices. To fulfill the main aim, the study addressed the following research questions.

1. What is the impact of Web 2.0 tools training on instructors?
   1.1. Is there a significant difference observed in instructors' TPACK competencies before and after the training?
   1.2. Is there a significant difference between the teachers' attitudes towards technology before and after the training?
2. What are the views of the instructors on Web 2.0 tools training?
3. How do instructors apply the knowledge, skills, and gains they acquire after the Web 2.0 tools training in face-to-face and online classroom environments, and how do they reflect them in classroom practices?

Method

Research Model

A mixed-methods approach was adopted in the study. Mixed-methods research involves making inferences using both quantitative and qualitative methods (Creswell and Tashakkori, 2007). Mixed-methods research aims to minimize weaknesses by taking advantage of the strengths of qualitative and quantitative research. In this regard, mixed-methods research functions as a third approach that addresses the major issues across the two traditions. Mixed methods address research questions in a comprehensive manner, eliminating ambiguity between quantitative and qualitative approaches (Ary et al., 2010; Creswell, 2014).

Web 2.0 Tools Training

The Web 2.0 tools training organized within the scope of technopedagogical education was delivered to instructors online and lasted a total of six weeks. During the training, various Web 2.0 tools that can be used in educational settings, such as Hihaho, Educaplay, NearPod, and Learning Apps, were explained in terms of their technological and pedagogical dimensions. Instructors had the opportunity to practice using the relevant tools each week.

Publication Ethics

Ethics approval was received from the Gazi University Ethics Committee (December 7, 2021; No. 2021-1163). Written informed consent was secured from all participants before they took part in the study.

Research Groups

First Research Group

The study involved 23 instructors of Turkish as a foreign language employed at state university language centers or private language institutions. Participants self-identified as having low to moderate proficiency in Web 2.0 tool usage and voluntarily enrolled in the online professional development program. The demographic characteristics of the instructors participating in Web 2.0 Tools Training are displayed in Table 1.

Table 1. Demographic Profile of the Instructors Participating in Training

Variable	Category	N	%
Gender	Female	18	78,3
	Male	5	21,17
Age	20-25	1	4,3
	26-30	10	43,5
	31-35	6	26,1
	36-40	3	13
	40 and above	3	13
Educational Level	Master's degree	14	60,9
	Doctorate (Phd)	9	39,1
Years of Service	1-5 years	9	39,1
	5-10 years	8	34,8
	10-15 years	2	8,7
	15 years and above	4	17,4
Total		23	100

Second Research Group

To understand how instructors applied the knowledge, skills, and gains they acquired after the online training within both on-site and online teaching environments, the researchers observed four instructors who took part in the study voluntarily. Out of the 23 instructors in total, these four were each observed for three weeks, resulting in a total of twelve weeks of classroom observations.

Data Collection and Analysis

Quantitative Data Collection and Analysis

To examine the impact of the Web 2 training, two instruments were administered as pretest and posttest: the “TPACK Scale” created by Horzum et al. (2014) and the “Attitude toward Technology Scale” developed by İpek and Kan (2019). Reliability analyses indicated Cronbach’s alpha coefficients of .96 and .91, demonstrating strong internal consistency. The collected data were examined using SPSS 22.0.

Qualitative Data Collection and Analysis

The semi-structured interview form applied to the trainers after the Web 2.0 tools training was analyzed using content analysis**.** In the study, the researcher used a "Semi-Structured Lesson Observation Form" to assess how four selected volunteer instructors constructed the knowledge, skills, and gains they acquired from the online training in their classroom practices, and the lessons were recorded. Data collection continued until thematic saturation was reached. Two field experts, in addition to the researcher, watched the video recordings and completed the observation form. In calculating inter-coder reliability, the observers' responses of "Yes" and/or "Partially yes" were treated as agreement. The reliability formula established by Miles and Huberman (1994) was used to assess the consistency among the coders. The formula is as follows: Consensus (%) = [Number of Agreements ÷ (Number of Agreements + Number of Disagreements)] × 100

Findings and Interpretation

Findings on Quantitative Data

The research group consisted of 23 members, fewer than 30. To assess the normality of the pre-test and post-test data, the researchers analyzed the TPACK Scale created by Horzum et al. (2014) and the Attitude toward Technology Scale created by İpek and Kan (2019) using the Shapiro-Wilk test, as the sample size was less than 30 (N < 30).

Findings on the Normal Distribution of Data from the Technological Pedagogical Content Knowledge Scale

At this research stage, the normality distributions of the pre-test and post-test scores of the "TPACK Scale" applied to 23 instructors in a single experimental group before and after the online Web 2.0 tools training were examined. *Table 2* shows the results demonstrating the normal distribution of data from the TPACK Scale.

Table 2. Findings on the Normal Distribution of Data Collected from the TPACK Scale

Measurement Tool	Group		N	Ss	Skewness	Shapiro-Wilk Test
Technological Pedagogical Content Knowledge Scale	Single Experimental Group	Pre-test	23	,73	-,443	,474
	Single Experimental Group	Post-test	23	,44	,020	,163

Table 2 shows that the pre-test scores ($p > .05$) and post-test scores ($p > .05$) of the instructors' technological pedagogical content knowledge—who participated in the online Web 2.0 tools training, the single experimental group—exhibited a normal distribution.

Since the data were normally distributed, the pre-test and post-test scores obtained from the TPACK Scale were analyzed with a dependent sample t-test. Table 3 shows these results.

Table 3. Results of the Dependent Sample T-Test on Pre-Test and Post-Test Scores from the TPACK Scale

Measurement Tool	Group	Sub-dimension		N	$\bar{x}$	S	SD	t	p
Technological Pedagogical Content Knowledge Scale	Single Experimental Group	Technology Knowledge (TK)	Pre-test	23	3,10	,80	22	-3,871	,00
			Post-test	23	4,02	,59			
	Single Experimental Group	Pedagogy Knowledge (PK)	Pre-test	23	4,17	,73	22	-1,692	,11
			Post-test	23	4,47	,45		-1,067	
	Single Experimental Group	Content Knowledge (CK)	Pre-test	23	4,38	,62	22	-2,810	,30
			Post-test	23	4,54	,38		-1,243	
	Single Experimental Group	Technological Content Knowledge (TCK)	Pre-test	23	3,64	,88	22	-3,084	,01
			Post-test	23	4,30	,53		-2,901	
	Single Experimental Group	Pedagogical Content Knowledge (PCK)	Pre-test	23	4,35	,45	22	-2,866	,23
			Post-test	23	4,50	,43		-1,692	
	Single Experimental Group	Technological Pedagogical Knowledge (TPK)	Pre-test	23	3,41	1,12	22	-1,067	,01
			Post-test	23	4,24	,64		-2,810	

	Single Experimental Group	Technological Pedagogical Content Knowledge (TPCK)	Pre-test	23	3,40	1,09	22	-1,243	,01
			Post-test	23	4,23	,64		-3,084	
	Single Experimental Group	Overall	Pre-test	23	3,80	,73	22	-2,901	,01
			Post-test	23	4,34	,44	22	-2,866	

Table 3 demonstrates that the mean scores of the 23 instructors in the experimental group did not change significantly from pre-test to post-test in the sub-dimensions of Pedagogy Knowledge, Content Knowledge, Pedagogical Content Knowledge in the Technological Pedagogical Content Knowledge Scale applied before and after the online Web 2.0 tools training, although there was an increase in favor of the post-test scores (p> .05). There was a significant difference observed between the pre-test and post-test mean scores in the sub-dimensions of TK, TCK, TPK, and TPCK. Statistical analysis revealed a significant difference between the instructors' pre-test and post-test mean scores.

Findings on the Normal Distribution of Data from the Attitude Toward Technology Scale

At this stage of the study, Table 3 shows findings on the normal distribution of data from the Attitude toward Technology Scale, and Table 4 indicates the results of the Wilcoxon signed-rank test, which reveals the differentiation between the pre-test and post-test scores of the "Attitude toward Technology Scale" applied to 23 instructors in the single experimental group.

Table 4: Findings on the Normal Distribution of Data from the Attitude toward Technology Scale

Measurement Tool	Group	Sub-dimension		N	Ss	Skewness	Kurtosis	Shapiro-Wilk Test
Attitude towards Technology	Single Experimental Group	Avoidance	Pre-test	23	,55	,052	,238	,498
			Post-test		,93	-2,122	4,479	,000
	Single Experimental Group	Willingness	Pre-test	23	,57	-,456	-,525	,492
			Post-test		,45	-,171	-,294	,906
	Single Experimental Group	Adoption	Pre-test	23	,44	-,591	,110	,220
			Post-test		,59	-1,109	1,802	,018

Huck (2008) stated that Skewness values are expected to fall within the range of -1 to +1, and Kurtosis values should be between +2 and -1. Table 4 shows that the data are not

normally distributed. Consequently, data were analyzed using the Wilcoxon signed-rank test. This test reveals the differentiation between the pre-test and post-test scores of the "Attitude toward Technology Scale" applied to 23 instructors in the single experimental group.

Table 5. Results of the Wilcoxon signed-rank test

Measurement Tool	Group	Sub-dimension	PreTest-PostTest	N	Mean Rank	Sum of Ranks	Z	p
Attitude Towards Technology Scale	Single Experimental Group	Avoidance	Negative Ranks	9	9,22	83,00	-,825	.410
			Positive Ranks	11	11,55	127,00		
			Equal	3				
			Total	23				
	Single Experimental Group	Willingness	Negative Ranks	9	9,06	81,50	-1,462	.144
			Positive Ranks	13	13,19	171,50		
			Equal	1				
			Total	23				
	Single Experimental Group	Adoption	Negative Ranks	9	10,89	98,00	-,610	.546
			Positive Ranks	12	11,08	133,00		
			Equal	2				
			Total	23				

Table 5 shows that the results from the Wilcoxon signed-rank test reveal no significant differences in the sub-dimensions of adoption, willingness, and avoidance among the 23 instructors in the experimental group. Specifically, the findings indicate that there were no significant differences in the following areas: adoption ($Z = -,610$; $p > 0.05$), willingness ($Z = -1.462$; $p > 0.05$), and avoidance ($Z = -,825$; $p > 0.05$).

Findings on Qualitative Data

Instructor Views on Online Web 2.0 Tools Training

At this stage of the research, after the online Web 2.0 tools training designed within the scope of techno-pedagogical training, a semi-structured interview form prepared by the researcher was applied to 23 instructors in the experimental group. Figure 2 shows the instructors' views on this training.



Figure 2. The instructor's views on Web 2.0 tools training

Instructor Views on the Contributions of Training

Instructors who took part in the Web 2.0 tools training in the context of technopedagogical education assessed the contributions of this training in three different dimensions.

Getting to Know Different Web 2.0 Tools. Instructors reported that the training they received allowed them to explore various Web 2.0 tools. One instructor expressed this view as follows:

I2: Thanks to this training, I learned about various Web 2.0 tools. My awareness of using technology in the classroom increased, and I realized that I could apply some of these tools to my academic studies outside of class.

Gaining In-Depth Knowledge of Web 2.0 Tools. The instructors indicated that the training they participated in helped them acquire detailed information about applications they were already familiar with. This perspective is illustrated in the following comment:

I18: I was aware that there are applications available for teaching Turkish to foreigners, but I was unfamiliar with their content and usage. Through this training, I have gained a detailed understanding of the features of each application, as well as their positive and negative aspects, allowing me to assess whether they are useful or not. Understanding the principles of multimedia design was incredibly beneficial for me.

Guidance for Instructors. Instructors stated that the training they received guided them on which tools to use in the educational environment and how to utilize them effectively. This sentiment was articulated by one instructor:

I19: In this training, I learned about various Web 2.0 tools employed to develop the four skills. I also gained an understanding of their purposes and how to effectively use them

with the examples provided during the training. I realized that utilizing technology in education is crucial; this training helped broaden my limited understanding and revealed the great opportunities available to us.

Instructor Views on the Positive and Negative Aspects of Training

Views on Positive Aspects of Training

Ease of Attending the Course. Participants cited the online modality as advantageous, emphasizing that it afforded convenient access to and participation in the training sessions. One instructor noted:

I8: Online learning allowed easy participation, and recording it was beneficial.

Saving Time and Space. The instructors stated that they saved time and space by receiving online Web 2.0 tools training. This perception is reflected in the following comment:

I2: I believe that online training saves time and space compared to face-to-face sessions, and I find it beneficial that we can revisit recorded sessions.

Breaking Out of Traditional Teaching. The instructors stated that thanks to online Web 2.0 tools training, they could break out of traditional teaching and use different methods. This view is illustrated in the following excerpt:

I10: I learned how to use several applications that I was previously unfamiliar with. I believe I can easily incorporate them into my lessons. I find it essential to utilize different methods other than traditional teaching approaches. Learning these tools has been a significant advantage for me.

Re-Watching the Training. Instructors highlighted the valuable opportunity to re-watch the training sessions whenever they couldn't attend or needed further explanation of the tools. One instructor noted:

I5: The online training I participated in was beneficial in many ways. Being recorded and able to listen to the sessions multiple times proved to be very helpful. The interactive use of technology made the learning process much easier. Additionally, the instructors offered useful suggestions during the introduction of the tools, which supported our material preparation.

Views on the Negative Aspects of Training

While 22 instructors participated in the online Web 2.0 tools training stated that there was no negative aspect of the training, 1 instructor evaluated the lack of time for practice as a negative aspect of the training.

Instructor Views on Providing Education in a Technopedagogical Context

Integration of Tools into Education. Instructors stated that they received training on Web 2.0 tools as part of technopedagogical training and gained detailed information on how to use these tools in learning environments. This view is illustrated in the following comment:

I18: Knowing technology doesn't equate to effectively using it in education. Thus, the training guided how to utilize technology with a focus on pedagogical considerations.

Getting to Know Experts in Different Fields. Instructors stated that by receiving Web 2.0 tools training within the scope of technopedagogical education, they had the chance to engage with different experts in informatics and teaching Turkish to foreigners and benefit from their knowledge. This perspective is reflected in the following excerpt:

I13: I was satisfied with the online training I received. Because there are many Web 2.0 tools, and as an instructor who does not know where to start learning them, it was useful to proceed systematically and receive training from experts in different fields. I got to know the tools and how to use them, and I can now decide more easily which tool to prefer for which subjects in the lessons.

Instructor Satisfaction with the Training

Satisfaction with Course Duration and Content. The instructors stated that the course duration was reasonable and the course content met their expectations. One instructor noted:

I12: I was extremely satisfied with the training. The interest and expertise of the trainers, along with our organizer, greatly facilitated the training. The duration and content of the lessons were both satisfactory. I received thorough answers to my questions about why and how we should utilize technological opportunities and Web tools in the classroom.

Satisfaction Towards Training Experts. Instructors stated that one reason for their satisfaction with the training is the presence of trainers who are experts in various fields. This view is illustrated in the following statement:

I7: Receiving training from experts in the field was beneficial for me. In the initial weeks, a teacher with extensive knowledge of computers and software shared valuable lessons and tools with us. Following that, we continued learning from instructors who had real-world experience in our field and were skilled at preparing materials, which I found to be a significant advantage. I cannot identify any negative aspects. I was very pleased that after the training concluded, all the links were compiled into a file. I hope we will always have access to these links, as I would like to refer back to them when we encounter topics that we forget or have difficulty remembering.

Satisfaction with the Originality of the Training. The instructors expressed contentment with the originality of the training, noting that it differed from other training programs in the field. One instructor remarked:

I11: This training, offered by field experts, is seminal in many subjects. It's pleasing to be in the digital age and have access to informative courses. Moreover, incorporating this innovative approach to education at the graduate level is highly beneficial for both academics and students. This method stands apart from the technology-focused training I have received in the past.

Instructor Attitude Towards the Training

The instructors who took part in the Web 2.0 tools training assessed their attitudes towards using these tools in an educational environment across two distinct dimensions after the training.

Willingness. The instructors expressed greater willingness to utilize the tools in the educational environment following the online training they received. This change is illustrated in the following comment:

I3: I recognized that I lacked skills in this area, but I believed that professional support was crucial for utilizing these tools effectively. During the training, I acquired a wealth of information, and most importantly, I received an archive of materials outlining how to use these tools. My attitude and willingness to use these tools have increased even more.

Developing a Positive Attitude. Some instructors who participated in the training stated that they exhibited a positive attitude towards using the tools in the educational environment after the training. This perspective is reflected in the following excerpt:

I16: In light of the subjects being taught, I have significantly refined my material preparation, content, and teaching methods before each lesson. This interactive approach greatly facilitated the lesson and the homework assignment process. I was able to check homework in a shorter amount of time, which fostered a positive attitude towards mutual benefit.

Use of the Tools in the Educational Environment

Instructors providing face-to-face and online education stated that they are considering the use of Web 2.0 tools in the classroom. This consideration is illustrated in the following comment:

I19: I have been teaching Turkish to non-native speakers since 2016, and I hold both a master's degree and a doctorate in this field. Unfortunately, unlike English and other foreign languages, our field lacks a substantial pool of teaching materials. As a result, instructors have a considerable amount of work to do. There are many foreign students who want to take Turkish lessons, both face-to-face and online. I understand the value of Web 2.0 tools in teaching our language more effectively. These tools allow students to learn beyond the traditional classroom environment, enabling them to continue their education wherever they are by simply following a link. Furthermore, they demonstrate that students can take control of their own development. From this point forward, I will consciously incorporate Web 2.0 tools into all my lessons.

Observing Instructors Participating in Online Web 2.0 Training

In the course of the research, various Web 2.0 tools that can functionally enhance language teaching were introduced to instructors during online training. Four instructors who volunteered for observation were asked to select the tools they preferred from those presented and use them in their classes for a duration of three weeks. The choice of tools

was entirely at the discretion of the instructors. Instructors utilized these tools whenever they were available, rather than using them in consecutive weeks.

Findings for the First Instructor. Based on the observations, the findings for the first instructor are presented in the table below.

Table 6. Findings for the First Instructor

Instructor	Implementation time	Learning environment	Level	Web 2.0 tool(s) used	Usage Area	Method/technique used
First Instructor	First week	Online	A1	Word Wall	Vocabulary teaching / Speaking skill	Question-answer
	Second week		A1	PowerPoint/ Educaplay	Grammar teaching / Speaking skill	Question-answer / demonstration method
	Third week		A2	Educaplay/ LearningApps	Listening skill/ Reading skill/ Speaking skill	Question-answer / demonstration method

Table 6 shows that the first instructor used Web 2.0 tools in the online classroom environment in the first week. This instructor preferred to utilize the Word Wall application for A1 level students. Activities were designed focusing on vocabulary teaching and speaking skills with this application. However, it was noted that the instructor did not employ any specific methods or techniques while using the application.

In the second week, it was noted that the first instructor preferred using PowerPoint and Educaplay for A1 level students. The instructor developed activities focused on teaching grammar as well as enhancing listening and speaking skills. Additionally, the instructor employed question-and-answer techniques and demonstration methods while using these applications.

In the third week, it was noted that the first instructor used the Educaplay and LearningApps applications, which are Web 2.0 tools, for A1 level students. The instructor employed question-and-answer techniques as well as demonstration methods while utilizing these applications. Additionally, the instructor prepared exercises aimed at improving the students' listening, reading, and speaking skills.

Findings for the Second Instructor. Based on the observations, the findings for the second instructor are presented in the table below.

Table 7. Findings for the Second Instructor

Instructor	Implementation time	learning environment	Level	Web 2.0 tool(s) used	Usage Area	Method/technique used

		t				
First Instructor	First week	Online	C2	Bubbl.us	Speaking skill	Brainstorming/ Question-answer
	Second week		A1	LearningApps	Teaching vocabulary / Speaking skills	Question-answer
	Third week		B1	Educaplay	Teaching vocabulary /Reading skill	Direct instruction / Question-answer

Table 7 shows that the second instructor utilized Web 2.0 tools in the online classroom during the first week. The instructor employed the Bubbl.us application for C2-level students. While using this application, the instructor implemented brainstorming and question-answer techniques. Additionally, he designed activities aimed at enhancing students' speaking skills with the application.

Table 7 indicates that the second instructor utilized the LearningApps application for A1 level students during the second week. Activities for teaching vocabulary and speaking skills were designed. The question-and-answer method was employed with the application.

The Web 2.0 tool utilized by the second instructor during the third week was Educaplay. In using this tool, the instructor employed direct instruction and question-answer techniques. The activities designed with this application focused on teaching vocabulary and enhancing reading skills.

Findings for the Third Instructor. Based on the observations, the findings for the third instructor are presented in the table below.

Table 8. Findings for the Third Instructor

Instructor	Implementation time	Learning environment	Level	Web 2.0 tool(s) used	Usage Area	Method/technique used
Third Instructor	First week	Face to face	A1	Crosswords	Teaching vocabulary/ Speaking skills	Question-answer
	Second week		A2	Educaplay	Teaching Grammar/ Assessment and Evaluation	Induction/ Question-answer
	Third week		B1	Educaplay	Teaching vocabulary/ Listening skill/ Writing skill	Direct instruction / Question-answer

Table 8 shows that the third instructor utilized Web 2.0 tools in the face-to-face classroom in the first week. The instructor preferred the Crosswords application for A1 level students, using it to create activities focused on vocabulary teaching and speaking skills. The question-and-answer method was employed with the application.

In the second week, it was determined that the third instructor preferred using the Educaplay application for A2 level students. The instructor created activities for teaching grammar, assessment, and evaluation with this application. Induction and question-and-answer methods were employed with the application.

In the third week, it was determined that the third instructor preferred the Educaplay application for B1-level students. Activities for teaching vocabulary and writing skills were designed, and direct instruction and question-answer techniques were used.

Findings for the Fourth Instructor. Based on the observations, the findings for the fourth instructor are presented in the table below.

Table 9. Findings for the Fourth Instructor

Instructor	Implementation time	Learning environment	Level	Web 2.0 tool(s) used	Usage Area	Method/technique used
Fourth Instructor	First week	Face to face	A1	Word Wall	Teaching Grammar/ Assessment and Evaluation	Direct instruction
	Second week		B1	LearningApps	Teaching vocabulary / Writing skills	Demonstration method
	Third week		B2	Hihaho	Listening skill/ Speaking skill	Brainstorming/ Question-answer

Table 9 shows that the fourth instructor utilized Web 2.0 tools in a face-to-face classroom setting in the first week. It was found that the instructor chose to use the Word Wall application specifically for A1 level students that week. The instructor employed this application to enhance grammar instruction and for assessment and evaluation purposes.

In the second week, the instructor employed the LearningApps application for B1 level students and utilized the demonstration technique with it. The instructor created activities for vocabulary teaching and writing skills using this application.

In the third week, it was determined that the fourth instructor preferred the Hihaho application for B2-level students. Activities for listening and speaking skills were designed, and brainstorming and question-answer techniques were used.

Conclusions, Discussion, and Recommendations

In this study, 23 Turkish as a foreign language instructors in Turkiye who possessed medium or limited proficiency with Web 2.0 tools volunteered to participate in an online training program that spanned six weeks. At this stage, the "TPACK Scale" developed by Horzum et al. (2014) was administered to the teachers before and after the online Web 2.0 tools training designed within the framework of technopedagogical education. After the training, it was found that the instructors' TPACK scores were significantly higher in the posttest. Therefore, it can be concluded that this training enhanced their technological pedagogical content knowledge. Türker (2020) conducted a study examining the TPACK of Turkish as a foreign language instructors, focusing on various variables. The research found that the TPACK of 277 instructors in this field was at a high level. The researcher emphasizes that it is highly important for instructors to have a high level of TPACK regarding the provision of learning experiences tailored to students talented in technology today. In the field of teaching Turkish as a foreign language, it can be said that the high level of technological pedagogical knowledge of the teachers will positively affect language teaching. Tseng et al. (2022) conducted a critical examination of 51 studies on TPACK in language teaching. They concluded that language courses that integrate technological pedagogical content knowledge are highly effective and beneficial for teaching languages. The findings support the objectives set out in this study.

The "Attitude toward Technology Scale" developed by İpek and Kan (2019) was administered to instructors both before and after the online Web 2.0 tools training. The results indicated that the instructors' pre-test and post-test scores were not significantly different regarding their attitudes toward technology. At this stage, to reach a more in-depth conclusion, qualitative data were gathered through a semi-structured interview form, and the collected data were analyzed. The analyses concluded that the instructors were satisfied with the training they received on Web 2.0 tools. The training had several positive impacts on the instructors, including exposure to various Web 2.0 tools and gaining detailed information about them. By offering this training within a technopedagogical framework, the instructors learned how to effectively integrate these tools into their educational practices. As a result of the training, the instructors became more willing to use these tools in their classrooms, developed positive attitudes toward them, and considered using them in both face-to-face and online teaching environments. This training was beneficial for developing instructors' technopedagogical skills.

After the training, two volunteer instructors were observed in a face-to-face classroom environment, and two other instructors were observed in an online classroom environment for three weeks each, totaling twelve weeks. In this process, the researcher recorded the lessons, and the recordings were monitored by two field experts, who filled out a semi-structured observation form. As a result of the observations, it was concluded that the instructors can easily utilize Web 2.0 tools in face-to-face and online classroom environments without any difficulties; the technical equipment of the educational environments is suitable for the use of technological tools; the instructors benefit from

different methods and techniques such as brainstorming, induction, etc. while using these tools; they can easily use these tools for students at various levels; and the instructors use these tools to improve students' basic language skills, grammar or vocabulary teaching, and assessment and evaluation, and they constantly interacted with students while using the tools. It was also observed that students actively participated in the lesson, engaged with one another, and enjoyed themselves while using Web 2.0 tools. Studies indicate that the use of Web 2.0 tools in the classroom environment positively affects students' motivation (Anwaruddin, 2013; Mete & Batıbay, 2019), class participation (Al-Mukhaini et al., 2014; Özipek, 2019), and academic achievement (Göker & İnce, 2019); increases interaction among students (Bay & Bademci, 2022) and contributes to a more effective and lasting foreign language learning experience (Çiftci & Sağlam, 2023).

Based on the findings, the following suggestions are offered for researchers, instructors, pre-service teachers, and related institutions:

- In this research, a technopedagogical training program was developed, and its effect on instructors' TPACK and their attitudes towards technology was assessed. Future studies could investigate how such trainings impact instructors' perceptions of their technopedagogical self-efficacy, motivation, and technology anxiety. It is important to examine the research from a broader perspective.
- Simply knowing how to use technological tools does not ensure that instructors will implement them effectively in the classroom. It is crucial to design in-service training programs that enhance instructors' technological pedagogical content knowledge and to motivate them to engage in these trainings.
- In this research, the group of instructors who received technopedagogical training was limited to 23 participants. Since the training was conducted online, the study group could be expanded, thereby increasing the representational value of the group.
- The research findings emphasize the important role of Web 2.0 tools for instructors and their use in classroom settings. It is crucial to delve deeper into these opportunities, as further investigation into the application of these tools within a technopedagogical framework could lead to transformative advancements in education.

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