



The Effect of 21st Century Skills Training on Foreign Language Teachers' Perceptions Regarding Their Educational Technology and Materials Development Competencies

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ABSTRACT

This study aims to show whether 21st Century Skills Material Design Teacher Training and Professional Development Program enhance foreign language teachers' perceptions regarding their educational technology and material development competencies. It is worthy of recommendation that teachers should learn what 21st century skills are and how to bring these skills into classroom by creating their own foreign language teaching materials through digital technologies. To that end, an 8-week teacher-training program was held at Istanbul University. Thirty-three English teachers participated in the study. Application-based Educational Technology and Material Development Competencies Scale was conducted as pre-test and post-test before and after 8-week training in order to measure changes of the teachers' perceptions. In addition, teachers' opinions have been obtained through structured interview technique to deepen the parts that are not acquired from quantitative data. Results of the study indicate that this type of strategy training was found useful for developing teachers' perceptions regarding their educational technology and material development competencies on 21st century skills.

Keywords: 21st century skills, material design, foreign language teaching, teacher training

21. YY Becerileri Eğitiminin Yabancı Dil Öğretmenlerinin Eğitim Teknolojisi ve Materyal Geliştirme Yeterliklerine İlişkin Algılarına Etkisi

Öz

Bu çalışma 21. Yüzyıl Becerileri Materyal Tasarımı Öğretmen Eğitimi ve Profesyonel Gelişim Programının, yabancı dil öğretmenlerinin eğitim teknolojisi ve materyal geliştirme yeterliklerine ilişkin algılarını geliştirip geliştirmediğini göstermeyi amaçlamaktadır. Öğretmenlerin 21. yüzyıl becerilerinin neler olduğunu ve bu becerileri dijital teknolojiler aracılığıyla kendi yabancı dil öğretim materyallerini yaratarak nasıl sınıfa kazandıracaklarını öğrenmeleri gerektiği tavsiye edilebilir. Bu amaçla, İstanbul Üniversitesi'nde 8 haftalık bir öğretmen eğitim düzenlenmiştir. Otuz-üç İngilizce Öğretmeni çalışmada yer almıştır. Uygulamaya Dayalı Öğretim Teknolojileri ve Materyal Tasarımı Becerileri Ölçeği öğretmenlerin algılarındaki değişiklikleri ölçmek için, 8 haftalık eğitimden önce ve sonra ön test ve son test olarak uygulanmıştır. Ayrıca, nicel verilerden elde edilemeyen bölümleri derinleştirmek için Yapılandırılmış Görüşme Tekniği ile öğretmenlerin görüşleri alınmıştır. Çalışmanın sonuçları, bu çeşit strateji eğitiminin 21. yüzyıl becerileri üzerine öğretmenlerinin eğitim teknolojisi ve materyal geliştirme yeterliklerine ilişkin algılarını geliştirmede faydalı olduğunu göstermektedir.

Anahtar kelimeler: 21. yüzyıl becerileri, materyal tasarımı, yabancı dil öğretimi, öğretmen eğitimi

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1 | INTRODUCTION

21st century is a period in which digital technologies are rapidly developing, changing, and spreading (Brunn & Kehrein, 2020). Digital technologies have been positioned in many areas of our lives and have become an indispensable part of it. One of the greatest areas where 21st century digital skills take place is education and training (Waycott et al., 2010).

Learning is a lifelong process. Thus, there are some human skills that 21st-century individuals should possess in the lifelong learning process; creativity and innovation skill, critical thinking and problem solving skill, communication and collaboration, information literacy, media literacy, ICT literacy, flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, productivity and accountability, leadership and responsibility skills (Prensky, 2001; Dishon & Glied, 2021; Stanley, 2021). The acquisition of these skills includes not only the students but also other groups such as teachers, leaders, administrators. Therefore, especially teachers must closely follow 21st century skills and use these skills in language teaching (Ilhan, 2004). They should apply to information and communication technologies (ICT) in education (Deshpande & Shesh, 2021). 3D video, smart board, info graphic and presentations, and virtual reality and augmented reality are the most important examples of 21st century digital arts. These technologies provide many benefits such as enriching the education and facilitating the teaching. The use of technology in the classroom changes lesson dynamics (Tondeur et al., 2017). For this reason, 21st century digital skills must be used in the preparation of foreign language teaching materials (Tomlinson, 2012). One of the best ways to do this is to educate teachers on a lifelong basis and to renew themselves and their daily practice in this context.

By means of foreign language learning tools created through newly acquired skills, teachers can enable students to relate to current life and language more easily (Harwood, 2010). Students are exposed to different situations of language and language used in real life, and they may have to communicate verbally to fulfil their linguistic tasks. However, many teachers do not have the detailed knowledge of what these skills are and cannot use these current language-teaching materials in class (Demirel & Budak, 2003). In fact, potential of technology in the learning-teaching process is known by all educators. Yet, this hardly changes teachers' professional and personal lives. Teachers' technology competencies will directly affect the service they offer (Seferoğlu, 2004). For the teachers who are not digitally literate properly, it will be difficult to apply digital technology for learning (Mutohhari et al., 2021). Hence, firstly teachers should be helped to become technology literate, and, in this regard, their in-service training incompetence should be eliminated.

PURPOSE OF THE STUDY

Today, with the development of technology, there are significant changes in the economy, jobs, and businesses. These changes require some abilities and traits serving teenagers in a time that is changing and developing so rapidly. Thus, preparing a child for the world is not an easy task for any teacher. Students need to be able to think and work creatively in both digital and non-digital environments to survive and succeed. Enhancing their communication and collaboration skills with others are essential not only for their learning but also their mental and emotional health. It is a necessity for them to be able to think critically, find useful information quickly, and use technology effectively. These skills, called 21st century skills, ensure what students need to compete and succeed. Furthermore, many materials have been added to the training process with these skills. Technologies such as smart board, presentation and internet-enabled applications, virtual reality and augmented reality provide a great contribution to the learning process. The use of these current technologies facilitates language teaching. However, foreign language teachers do not have enough knowledge about what 21st century digital skills are and how to use them in language teaching (Ananiadou & Claro, 2009).

Herewith, this research aims to provide foreign language teachers an in-service training involving 21st century skills, to investigate the influence of this teacher training on teachers' perceptions regarding their educational technology and material development competencies on 21st century digital skills.

LITERATURE REVIEW

How Has the World Changed, and What Does This Mean for Education?

The world has changed significantly in the last few decades. Fundamental changes have affected economy, jobs, and businesses. They have started to reshape workplaces and the nature of work. Industrial economy has transformed a service economy, which is driven by knowledge, innovation, and creativity (Madsen & Bowen, 1978; Voogt & Roblin, 2010). Many jobs in the service sector need high-wage, high-growth, and high-skilled occupations. Technology has helped companies as they have renewed the way they do business. These fundamental changes in the economy, businesses, and jobs call some new, different skills for individuals. Alterations in society and economic growth demand that young people should be equipped with new skills and competencies, which allow them to actively make a major contribution to economic development (Ananiadou & Claro, 2009). These skills and competencies are called 21st century skills and competencies (Geisinger, 2016). They are more related to the needs of social and economic progress. They also help young people to experience the new forms of socialization. Young people must be able to perform creative tasks to succeed.

According to P21 (Partnership for 21st Century Skills), for a young learner whose plan is to attend a university, or enter the workforce directly, it is a requirement to be able to think critically, solve problems, communicate, collaborate, find useful information quickly, and use technology effectively (Greenhill, 2010). These are today's survival skills what learners need to succeed and compete.

What are the 21st Century Skills?

21st century skills are what students need for life today. They are a series of concepts that use technology safely and effectively. They provide what students need to compete and succeed. Aim of the 21st Century Skills is to make students to be better problem solvers and innovators.

1. Learning and Innovation Skills: Learning to Create Together

Learning and innovation skills increasingly are so essential that they prepare students for the future (Erten, 2020). They encourage students to think about outside of the box and focus on creativity, critical thinking, communication, and collaboration.

1.1. Critical Thinking and Problem Solving

Critical Thinking is a form of thinking that consists of intellectual processes such as reasoning, analysis, and evaluation. Problem solving is a cognitive process for transforming a given situation into a result situation when there is no explicit solution for the problem solver. It is goal-oriented behavior (Richards, 2021). Problem solving and critical thinking are a kind of ability that both can use knowledge, beliefs, and arguments to effectively solve problems. They solve many kinds of non-familiar problems in both conventional and innovative ways. They support individuals to make decisions and evaluate the effect that personal actions have on others (Koehler et al., 2011). They are quite significant to all aspects of life, school, and work. Furthermore, these skills are integrated with many other 21st century skills. All 21st century skills complement each other. In an attempt to acquire the skill of critical thinking and problem solving, students should be able to:

Reason Effectively

The concept of critical thinking and problem solving requires using several types of reasoning such as comparative reasoning, cause-and-effect reasoning, deductive reasoning, or inductive reasoning (Trilling & Fadel, 2009). Selecting the appropriate type of reasoning depends on the situation.

Use Systems Thinking

Students should analyze how parts of a whole interact with each other in complex situation. They can apply to systems thinking which increases choices to solve a problem by widening learners' thinking and helping learners to utter problems in new and different ways.

Make Judgments and Decisions

Students should follow some phases to make judgement and decisions. First, they should analyze knowledge, beliefs, data, and evaluate alternative points of view. Learners should make connections between information they

obtain and use old concepts to create new ideas (Larson & Miller, 2011). Assessing theories and comparison of ideas help them to interpret information. Conclusion depends on the best analysis.

Solve Problems

As Trilling and Fadel (2009) state, to achieve more advanced solutions, non-familiar problems must be solved in both conventional and innovative ways; significant questions must be specified and asked; various opinions must be evaluated.

1.2. Communication and Collaboration

While communication articulates thoughts and ideas effectively using oral and written communication skills in a variety of forms and contexts, collaboration demonstrates ability to work effectively and respectfully with diverse teams. They are the ability of individuals to use effectively digital tools to discuss and come to conclusion together (Koehler et al., 2011). They help students' communication and cooperative learning skills.

Communicate Clearly

Individuals should be able to express their thoughts and ideas effectively by applying to oral, written, and nonverbal communication skills in diverse settings. It is important to listen efficiently to sort out meaning, involving information, beliefs, and attitudes. Learners should use communication for a variety of purposes in order that enlighten, teach, motivate, and encourage. Multiple media and technologies should be utilized, and it is essential to communicate effectively in diverse environments.

Collaborate with Others

Diverse teams mean different ideas and attitudes. Individuals should have an ability to work respectfully with others in a diverse team (Care et al., 2015). They must be enthusiastic and helpful in making necessary negotiations to achieve a common goal. Collaborative work indicates taking responsibility and showing value the individual contributions made by each team member.

1.3. Creativity and Innovation

Creativity and innovation are to think outside the box. They use a large variety of idea creation techniques to create new and worthwhile ideas and gather information to find innovative solutions to problems and overcome challenging situations (Piirto, 2011). Students should be able to:

Think Creatively

Creative thinking refers to finding, analyzing, and evaluating different and useful ideas (Erdoğan, 2020). Using idea creation techniques such as mind mapping, brainstorming, roleplaying helps creativity and innovation. It is important for individuals to create new and worthwhile ideas (Nakano & Wechsler, 2018). Students should define, enhance and evaluate their own ideas so that they can improve and raise creative efforts.

Work Creatively with Others

Working with others requires being open and responsive to new ideas (Uçak & Erdem, 2020). Cooperation with the group and feedback should be provided into work. Individuals should see failure as an opportunity to learn and retain their creativity for a long time. They should keep originality and creativity in work by adopting new ideas.

Implement Innovations

Students should follow up creative ideas to make a worthwhile contribution to the field in which the innovation will take place.

2. Digital Literacy Skills

As people are in a technology and media-involved environment, it is easy for them to access to an abundance of information. They can follow rapid changes in technology tools. Moreover, they can contribute individually on these changes (Van Laar et al., 2017). To be an active individual in the 21st century, people must be able to create and rewardingly use information, media, and technology.

2.1. Information Literacy

Information literacy is a set of skills that it can find information and identify it (Voogt & Roblin, 2012). It evaluates information and its sources critically. Information literacy synthesizes all the sources and determines how to present them according to people needs so that they can use it.

Access and Evaluate Information

Thanks to information technologies, information produced anywhere spreads rapidly. In this way, it becomes easier for individuals to improve themselves (Özçiftçi & Çakır, 2015). Individuals should access information by using sources effectively and treating time efficiently. Evaluation of information needs to be done critically and competently.

Use and Manage Information

It is necessary to produce creative solutions for the issue or problem at hand. By means of variety of sources, information should be used and managed accurately (Trilling & Fadel, 2009). Ethical and legal issues must be applied while all this process is going on.

2.2. Media Literacy

Media Literacy is an indispensable skill to be able to read many types of media. It is a kind of ability to access, analyze, evaluate, and create media (Mcdougall et al., 2018). Media Literacy skills can help individuals in terms of developing critical thinking skills, evaluating latest ideas, creating, and distributing our own media messages.

Analyze Media

Individuals should realize both how and why media messages are constructed, and for what purposes. People can infer messages differently, and media can affect their beliefs and attitudes. Ethical and legal issues must always be followed in access and use of media.

Create Media Products

The most appropriate media creation tools should be selected according to its features, and the most suitable interpretations should be used effectively in diverse environments (Trilling & Fadel, 2009).

2.3. ICT Literacy

Information and communication technologies are crucial tools of 21st century. ICT Literacy is the ability to use communication tools and technology (Siddiq & Scherer, 2019). It is the capability of an individual to access, identify and present information to enhance critical thinking.

Apply Technology Effectively

Today, technology is all aspects of human life. It requires people to be a technology literate person who is capable of using digital technology tools and social networks efficiently with the purpose of accessing, managing, evaluating and creating information. This communication and interacting tools should be used appropriately to research and communicate information. It is crucial to apply legal and ethical issues in the access and use of information technologies (Dede, 2010).

3. Life and Career Skills

Today's students need teachers who are capable of teaching skills that enrich students' future workplace environment. The Partnership for 21st Century Skills suggests that students should have the opportunity to learn:

3.1. Flexibility and Adaptability

Flexibility and adaptability are the characteristics of an individual who is open to new ideas and change, which makes it easier for the person to adapt to the changing environmental conditions. So as to adapt to business and education life, this feature should be gained to individuals (Eryılmaz & Uluyol, 2015). Students should be able to:

Adapt to change

When students attend a university, or enter the workforce directly, they are expected to adapt to new contexts, roles, accountabilities, and work effectively in changing conditions (Geisinger, 2016).

Be flexible

It is normal to be criticized as much as to be praised. It must be open to praise and criticism. As different ideas and beliefs take part in multi-cultural environments, it is necessary to be responsive to this diversity and assess feedbacks effectively.

3.2. Initiative and Self-Direction

Manage goals and time

Individuals should first set short-term and long-term goals, treat the time well, and manage assignments efficiently (Gut, 2011).

Work independently

Students should be able to observe, describe, prioritize and fulfil tasks without direct oversight.

Be self-directed learners

Learners should approach learning as a lifelong process and overreach their own opportunities to gain proficiency. They should benefit from past experiences to assess future progress.

3.3. Social and Cross-Cultural Interaction

Interact effectively with others

Communication and interaction with others involve respect and professionalism, and learners should know when it is appropriate to listen and when to speak (Van Laar, 2017).

Work effectively in diverse teams

Working with others means people from different cultures, different ideas and values. To increase innovation and quality of work, individuals should approach these differences open-mindedly and work effectively with others.

3.4. Productivity and Accountability

Manage projects

Learners should be able to set goals even if they are exposed to obstacles and pressure. They should keep managing work to achieve the intended result.

Produce results

Individuals should manage time efficiently and work positively and ethically while producing high-quality products. Participating actively is important as much as being punctual and reliable (Gut, 2011). Each individual should collaborate effectively with others, respect team diversity, and be accountable for results.

3.5. Leadership and Responsibility

Guide and lead others

Individuals should not only guide others but also benefit from strengths of others. Problem-solving skills can be used to influence and inspire others. In addition, ethical behavior should be demonstrated in using influence and power.

Be responsible to others

Learners should act responsibly because working and collaborating with others demand taking responsibility (Kivunja, 2014). In the 21st century, every student must learn the essential skills for success. They must be a critical thinker and a problem solver to effectively analyze and evaluate various kinds of ideas and different attitudes. They must be an effective communicator and collaborator to use digital tools to discuss and come to conclusion together. They must be aware of information and media literacy to use information accurately and

creatively and to be able to read many types of media (Wallis & Steptoe, 2006). Thus, teachers should learn 21st century skills, focus on content knowledge and bring the real-world data and tools in the classroom. Students learn best when they actively deal with problems.

To prepare 21st century learners for life, it is also important how is taught not just what is taught. Therefore, it is necessary to prepare current teachers and think of future teachers with equipped documents and resources that allow them to bring 21st century skills into the classrooms in appropriate ways.

TEACHER TRAINING AND PROFESSIONAL DEVELOPMENT PROGRAM ON 21ST CENTURY SKILLS

For the 21st century skills movement to be successful, one must look at what is happening in the world's classrooms. Since teachers are at the forefront, they must have the knowledge and some skills that enable them to be an efficient teacher by teaching 21st century skills (Saavedra & Opfer, 2012). This makes them an effective 21st century teacher. Both new teachers-in-training and current teachers must take part in teacher professional development programs, which provide the learning experiences to prepare teachers to gather collaborative teaching methods and to use technology and assessments of 21st century skills effectively in their everyday classroom work.

One of the studies claims that twenty-first century skills education is aimed to guide education professionals along the process of actualizing in a three-step process, starting with the teacher's own acquisition of relevant skills, followed by development of learners' twenty-first century skills using suitable pedagogy, and lastly the assessment of learner performance for evaluation and improvement (Chu et al., 2021).

Organization for Economic Co-operation and Development (OECD) organized a questionnaire study for the teaching and assessment of 21st century skills and competencies in OECD countries. The study was conducted from June to August 2009. The questionnaire was sent to all OECD member countries, including Turkey. In the study, Turkey was asked if there is specific coverage of 21st century skills or competencies in the regulations (e.g., curricula, national standards) or guidelines/recommendations for compulsory education in Turkey. If it comes to that, the question about which skills/competencies are covered by these policies was asked. Some skills such as critical thinking, problem solving, communications were selected as basic skills in the Turkish primary and secondary curriculum.

In addition, Turkey was asked to briefly explain (1) the policy context and rationale that led to the introduction of these regulations or guidelines concerning 21st century skills and competencies, (2) if there are regulations or guidelines related to the assessment or evaluation of these competencies/skills and (3) if these regulations or guidelines have an impact on teacher training programs. It was concluded that most of these skills are taught across curricular areas. However, ICT-related ones like media literacy, technology literacy are taught separately. There are no assessments policies or teacher training programs specifically targeted to these skills and competencies in Turkey (Ananiadou & Claro, 2009).

Accordingly, 21st century skills training starts with teacher preparation programs. It requires preparing tomorrow's teachers to work with students (Romijn et al., 2021). When teachers are prepared to work with the changing needs of today's students with the help of 21st century skills teacher training and professional development programs, there is only one thing left: bringing these skills into classroom. Therefore, teachers must know 21st century skills and prepare their own materials by applying to 21st century skills.

MATERIAL DESIGN

Recent technological advances have required both new approaches and new methodologies in the field of foreign language learning and teaching (Can, 2009). Herein, teaching materials play a significant role on many English instructional plans. English language classrooms are diverse places in the sense of individual learners within each context. A teacher can develop materials in which students can associate their language and culture to their second foreign language. Tomlinson (2011) relates commonly agreed principles of SLA (Second Language Acquisition) to the development of language-learning materials. Additionally, teacher-prepared materials offer the opportunity to teachers that they can make decisions about the most appropriate materials and activities for foreign language learners. Hence, Maley (2011) has studied on the principles behind ideas for materials development. Kervin and Derewianka (2011) and Motteram (2011) claim that principles need to be applied on making use of new technologies, principled and effective materials. Tomlinson (2008) suggests ways of applying commonly agreed theories of language acquisition to materials development.

According to language acquisition principals, teachers should help learners to be able to make connections between mother tongue and target language. They should bring real life situations into classroom and apply to authentic materials. In their studies, Şimşek and Can (2019) state that one of the best ways of bringing real life situations into the classroom is to use virtual reality. Foreign language education through virtual reality is similar to foreign language education in real environments. On the other hand, finding the appropriate materials for each topic or each level is not easy. Thus, foreign language teachers must prepare their own materials.

RESEARCH QUESTIONS

Competent teachers always choose materials by content to ensure the optimal congruence between materials, methodology, learners, goals, target language, and the teacher's personality and teaching style (Howard et al., 2021). However, most language teachers continue to use textbooks even though they have adequate equipment to use technology efficiently in their classes. In addition, the study conducted by OECD (Organization for Economic Co-operation and Development) in 2009 shows that some of the 21st century skills are taught separately and there are no assessments policies or teacher training programs specifically targeted to these skills and competencies in Turkey. Such studies and personal experiences have shown that teachers do not have enough knowledge about 21st century skills and they do not use the technology that the age demands. Accordingly, young people cannot access the information quickly, think critically and collaborate with others easily.

Taking into consideration all these problems, the overarching questions this study sights answers are below:

1. What are the 21st century skills that foreign language teachers can use in their lessons?
2. Do foreign language teachers' perceptions on preparing language-teaching materials change when they have in-service training involving 21st century skills?
3. How has 21st century skills teacher training influenced teachers' teaching/classroom practices?

2 | METHOD

RESEARCH MODEL

Since both quantitative and qualitative methods have been used in the study in order to reach many people with the quantitative method and to further deepen and elaborate the findings obtained from the quantitative data with the qualitative method, to increase the generalizability of the results obtained from data analysis, and to cover the weaknesses of one method with the strengths of the other method, mixed method has been used in the research (Creswell, 2014). As it was aimed to combine the results obtained from the analysis of qualitative and quantitative research data, Concurrent Triangulation Technique, one of the mixed method designs, has been used in the study (Creswell & Plano Clark, 2007). In the quantitative part of the study, The Experimental Research Method has been used to observe the effects of a variable in an event on the result and to test the cause-effect relationship (Özmen & Karamustafaoğlu, 2019). In the qualitative part, The Phenomenological Research Method, which is one of the qualitative research designs that emphasizes how people perceive reality, emphasizes experiences related to these perceptions, and aims to reveal the hidden experiences that people have lived, has been applied (Sanders, 1982; Yıldırım & Şimşek, 2003).

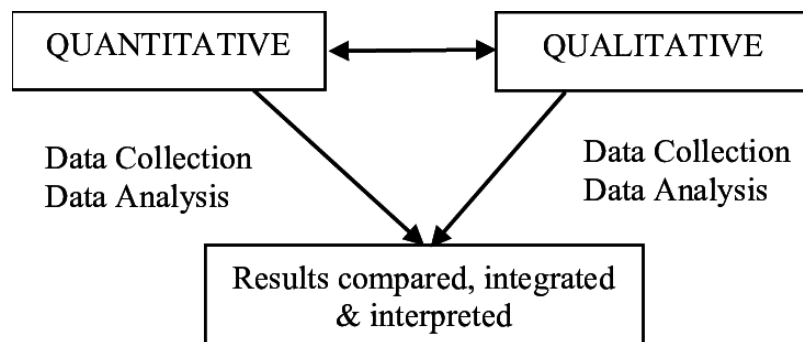


Figure 1. A Visual Diagram of the Mixed-Methods Concurrent Triangulation Strategy

RESEARCH SETTING AND PARTICIPANTS

The participants of the study are the teachers working at public schools in Istanbul and voluntarily attending Istanbul Directorate of National Education Language Academy. The Language Academy was founded by Istanbul Directorate of National Education. Each term of the year, English teachers, living in Istanbul, apply for the academy. The teachers are randomly selected by the Language Academy whose aim is to create vocational development projects for foreign language teachers and they get seminars and in-service training thanks to the academy. The academy takes one term for each group. The teachers in the study were those who were selected by the academy and graduated from the first term of the academy. In the second term, they attended the seminar which was arranged by the researcher. The number of teachers who took part in this study was 33. The distribution between sexes was unequal; 30 of the participants were female, and 3 were male.

The teachers attended an 8-week “21st Century Skills and Material Design Teachers’ Training and Professional Development Program”, held on February 10th - March 31st, 2018, at Istanbul University Hasan Ali Yücel Faculty of Education. The university gave permission to the researcher to run the study in computer lab at Istanbul University. At the end of the program, the teachers were given the participation certificate.

DATA COLLECTION TOOLS

The teachers were given a training that informed about 21st century digital skills and how they could be used effectively in language teaching. Throughout the training, all teachers participated in the training actively and shared what they have learned in education as online, both during training and in their own classes. Briefly stated, with this training, it was aimed that teachers learn 21st century skills, how to prepare foreign language teaching tools practically and increase their technology literacy.

Before starting teachers’ professional development program, Application Based Educational Technology and Material Development Competencies Scale, developed by Varank and Ergün (2009), was applied as a pre-test. (Permission to use the scale was obtained.) 8 weeks later, to learn teachers’ perceptions regarding their educational technology and materials development competencies, the same scale was applied once again to the teachers as a post-test. In this regard, it has been determined whether the teacher professional development program about 21st century digital skills and preparation of foreign language teaching materials have an influence on teachers' in-service qualifications.

For reliability and validity of the scale, four different analyses (respectively Kaiser-Meyer-Olkin (KMO), Bartlett Sphericity Test, Varimax Factor Analysis and Cronbach Alpha) were used. The result of KMO Test is 0.96, Bartlett's is ($\chi^2=27541.93$; $p<0.05$). For 39-item scale, Cronbach Alpha internal consistency coefficient was found as 0.95 (Varank & Ergün, 2009).

In all the statements in the survey, respondents were asked to show if they have changes of their educational technology and material development perceptions by marking one of the options among “I do not have”, “I am not sure whether I have it or not”, “I have” and “I absolutely have”. The scale measured the statements on SPSS (Statistical Package for the Social Sciences 25.0).

In addition, a month after post-test, teachers' opinions were obtained through structured interview technique to deepen the parts, which are not obtained from quantitative data. It is the most important convenience presented by this interview technique to provide more systematic and comparable information because it is maintained in accordance with the pre-prepared interview protocol. Thus, the contribution of 21st century digital skills to teachers' self-efficacy has been measured in more detail. By means of these data collection tools, the perceptions of the teachers before the training have been compared with those after the hands-on training.

DATA COLLECTION

8-week teacher training program was held with the teachers of Istanbul Directorate of National Education Language Academy at Istanbul University Hasan Ali Yücel Faculty of Education. Main titles of the 21st Century Skills were divided into 8 weeks. Every week, the theoretical knowledge about each title was given first. Then the applications related to the topic of the week were examined and the materials were prepared together. The topics were explained on the host computer by reflecting on the board via projector. For communication, a group was formed on mobile phone before the training began. Likewise, a group named “21st Century Skills” on Google

Classroom by Gmail was created to share the materials that we prepared during the training. Every week printed documents were provided to the teachers.

Table 1. Main Titles of 8-Week 21st Century Skills and Material Design Teacher Training and Professional Development Program

Weeks	Titles
1 st Week	The Emergence of 21st Century Skills What is 21st Century Learning and P21? What are the 21st Century Skills? Necessity of a Teacher Training to Acquire 21st Century Skills Factors to Consider When Designing Materials
2 nd Week	Critical Thinking and Problem Solving
3 rd Week	Communication and Collaboration
4 th Week	Creativity and Innovation
5 th Week	Information Literacy
6 th Week	Media Literacy
7 th Week	ICT Literacy (Information and Communication Technology)
8 th Week	Life and Career Skills Flexibility and Adaptability Initiative and Self-direction Social and Cross-cultural Interaction Productivity and Accountability Leadership and Responsibility

DATA ANALYSIS

Application-based Educational Technology and Material Development Competencies Scale, applied at the beginning and end of the training as pre-test and post-test, has measured the statements on SPSS. The participants showed if their educational technology and material development perceptions have changed by marking one of the options among “I do not have”, “I am not sure whether I have it or not”, “I have” and “I absolutely have”.

The aim of the 39-item scale is to look at what teachers think and how they perceive their competencies on educational technology and material development because the scale used in the study does not measure the participants' actual competencies. Thus, the answers given by 33 participants to the 39-item scale on the pre-test and the post-test were compared and 39 means were obtained. A paired samples t-test was conducted to compare the mean scores of pre-test and post-test of Application-based Educational Technology and Material Development Competencies Scale to find out whether the training is helpful in developing learners' perceptions on 21st century skills and material design or not. The maximum increase is in the 17th item, while the minimum increase is seen in the 5th item.

Question 5: “*Being able to develop plans related to course (annual plan, daily plan, etc.)*”

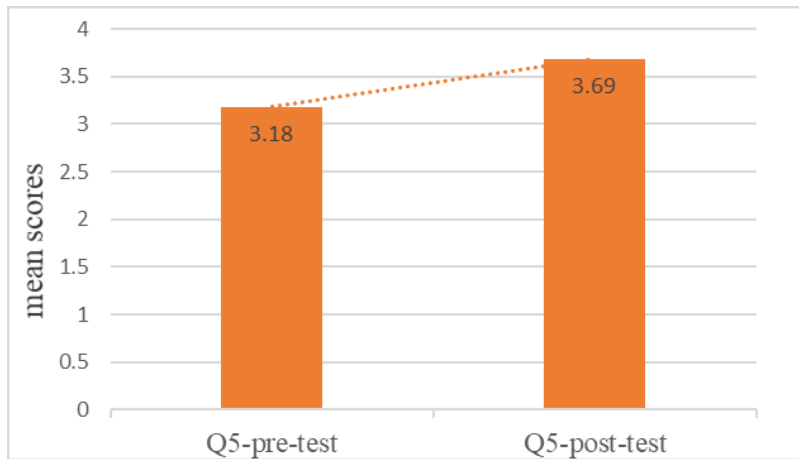


Figure 2. Mean Scores of Pre-test and Post-test Question 5

When Figure 2 is examined, it is understood that there is a statistically significant difference between pre-test Question 5 ($M= 3.18, SD=0.76$) and post-test Question 5 ($M= 3.69, SD=0.52$) scores with regard to strategy training inventory ($t(32)= -2.948, p<0.01$).

Question 17: “*Being able to plan a distance education that can be done over the internet.*”

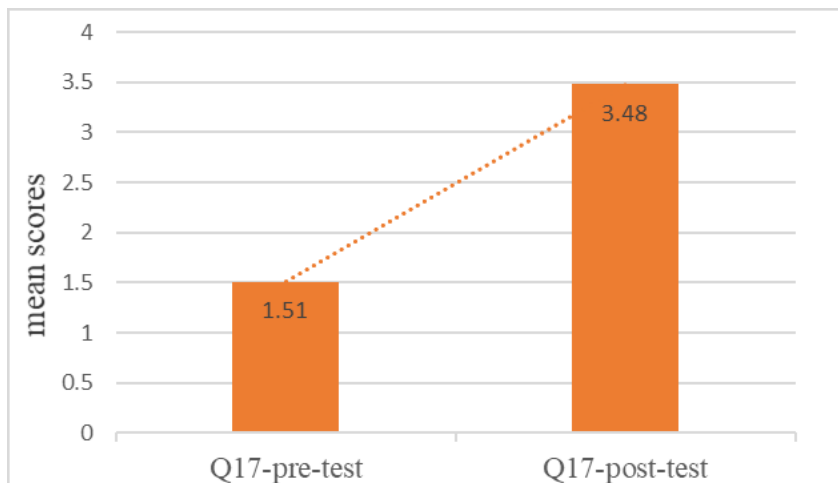


Figure 3. Mean Scores of Pre-test and Post-test Question 17

When Figure 3 is examined, it is understood that there is a statistically significant difference between pre-test Question 17 ($M= 1.51, SD=0.61$) and post-test Question 17 ($M=3.48, SD=0.50$) scores with regard to strategy training inventory ($t(32)= -15.538, p<0.01$).

The results show that this type of strategy training was found useful for developing teachers’ perceptions regarding their educational technology and material development competencies on 21st century skills in the current study.

TRANSCRIPTS OF STRUCTURED INTERVIEW

The records of the structured interview technique used to deepen the insufficient parts obtained from the quantitative data have been noted in writing and the analysis of the transcripts has been evaluated independently. As the researcher has structured the questions, transferred the interviews to the text and standardized evaluation guidelines by using coding qualitative data technique, reliability of structured interview has been achieved.

9 questions about experiences of the teachers before-during-after the training were asked through structured interview a month after 8-week training/post-test. The answers were analyzed by using coding qualitative data technique. While coding, the researcher has found some common themes.

1- What does 21st century learning look like before/after this teacher-training program?

Prior Knowledge

50% of the teachers did not have knowledge about 21st century learning while 25% of them had before and 25% of them noticed an increase in their knowledge.

<...before this teacher-training program, it was a bit far from me but after it, I am more familiar with 21st century learning...>

<Actually, I have had info about it but it was not enough and also was not in favour of using technology much. After this program, my thoughts have changed forever...>

2- How have schools successfully transformed their students' learning experiences by incorporating 21st Century Learning into teacher practice, curriculum, assessment, and professional development?

Attitudes of Schools

While 75% of the teachers think that schools have not changed their teaching methods by incorporating 21st Century Learning, the others claim that schools have changed their students' learning experiences by providing smart boards and projectors into classrooms.

<Unfortunately, schools are mostly focusing on the technology...Teachers use web 2.0 tools.... However, 21st century learning is more than using technology...>

<I think schools have not successfully transformed their students' learning experiences... >

3- Before the teacher professional development program, did you create learning practices, human support and physical environments that will support the teaching and learning of 21st century skill outcomes?

Prior Teaching Practices

All the teachers created learning practices before. However, they do not find them sufficient.

<Yes, I did but I did not see them enough. That's why I wanted to take this training.>

4- Do you know how to support professional learning communities that enable educators to collaborate, share best practices and integrate 21st century skills into classroom practice? (Collaborative learning tools like Padlet, Zoho Show)

Knowledge of Collaborative Learning Tools

During the teacher training, some collaborative learning tools were taught such as Padlet, Zoho Show, Google Drive and QR Code. All the teachers think that they have learned such tools and started to use them in their own classes.

<Yes, I have learnt them in this course... I use especially Padlet in my eTwinning projects.>

5- Do you know how to support expanded community and international involvement in learning, both face-to-face and online? (Distance education /Nearpod)

Knowledge of Face-to-face and Online Teaching Materials

All the teachers think that they have learned how to do distance education via as Nearpod, Adobe Connect and reach expanded community by means of eTwinning, Turkish National Agency, EPALE, Prezi and Emaze.

<I think Nearpod has many advantages. Prezi is a practical software...>

6- What do you think if both teachers, in-service training, and current teachers need a teacher training on 21st Century Skills and Material Design?

The necessity of the 21st Century Skills and Material Design Teacher Training

All the teachers agree that both teachers, in-service training, and current teachers should definitely need this training on 21st century skills.

<Definitely, they should because most teachers in state schools are not used to using technology in lessons.>

7- In your classes, have you applied to instructional materials and methods that you have learned in this teacher-training program? If so, could you share your innovative learning practices?

Reflections of the Teacher Training Program into Their Own Classes

During the teacher training, the teachers prepared their own materials about the topics they learned and shared them on Google Classroom. They also sent photographs and videos showing how they used these materials in their own classes.

<I have used “Plickers” to make a revision for my 4th grades... “Quiver” with my 2nd grades to let them talk about animals as well as to revise the colors and action verbs... “Bandicam” for my eTwinning project to record a video...>

<I shared my “Padlet” link so that students can practice listening skills and vocabulary.>

8- We expect our students to be passionate, compassionate, and thoughtful, and to ensure that students feel valued and included in a collaborative learning environment. How do you prepare your students for 21st century challenges?

Preparing Students for 21st Century Challenges

Whole teachers try to motivate their students. If they have enough time and equipment, they claim that they can use technology more efficiently to prepare their students for 21st century challenges.

<... I mainly focus on making my lessons interesting and enjoyable using different tools including web 2.0 and web 3.0 tools so that the students can be more open to learning of a foreign language... my students benefit from peer learning which makes me prepare activities that include collaborative learning environment...>

3 | FINDINGS

With this study, the researcher is able to obtain the results on the evaluation of 21st Century Skills Material Design Teacher Training and Professional Development Program with structured interview specifically designed for this study and a competency scale done by 33 English teachers working at public schools in Istanbul and voluntarily attending Istanbul Directorate of National Education Language Academy. The purpose of the study, in particular, was to provide foreign language teachers an in-service training involving 21st century skills, to investigate the influence of this teacher training on the preparation of foreign language teaching materials for language teaching, and to learn teachers' perceptions on 21st century digital skills.

Application-based Educational Technology and Material Development Competencies Scale was used for this study. The scale was conducted as a pre-test and post-test before and after 8-week training. To learn teachers' perceptions regarding their educational technology and material development competencies on 21st century skills and help them to create their own teaching materials, an 8-week training was held at Istanbul University. Finally, teachers' opinions have been obtained through structured interview technique to deepen the parts that are not obtained from quantitative data.

Specifically, three research questions guided this study:

1- What are the 21st century skills that foreign language teachers can use in their lessons?

All essential information about 21st Century Skills was presented to the teachers on the first week. Then, the title of each skill was explained in detail in the other weeks. The teachers learned many activities and technological tools related to each skill. The first week was mainly a theoretical week. A broad summary of what has been described in the literature review was explained on Prezi (Online Presentation Software). The training began with the explanation of how the 21st century skills emerged. The theme of Critical Thinking and Problem Solving was explained by using PowerPoint on the second week. For Problem Solving skill, the teachers learned how to create

and use QR Code. On the third week, the teachers have learned communicative and collaborative learning tools to prepare something without they do not have to come together, when they or their students need to work together with their pairs or group friends. Teachers should improve their creativity and innovation skills. They should learn to use any materials or sources in different forms. It is also important for students to acquire this creativity skill. To that end, teachers were taught to prepare their own videos during "Creativity and Innovation" week. Information literacy is a crucial skill to be able to accurately evaluate information, effectively use, and clearly communicate it in various formats. An information literate person should be able to identify information needs, understand the structure of information, and evaluate information and its sources critically. Augmented Reality and Virtual Reality Tools were explained for information literacy on the fifth week. On the sixth week (Media Literacy week), the teachers learned how to create an animation and some solutions to technical problems.

On the seventh week, Information and Communication Technology (ICT) is a diverse set of technological tools such as computers, smart boards, tablets, mobile devices, and the Internet that are used to communicate, create, and manage information. In Turkey within the scope of Fatih Project (Increasing Opportunities and Technological Improvement Action Project), The Ministry of Education and Ministry of Transport, Maritime Affairs and Communication provide a laptop computer, a projection device, and a smart board in each class and tablets for students. (Fatih Project) Thus, the teachers were shown some applications and programs used with ICT tools. For 7 weeks, the teachers have learned how to bring 21st century skills into classroom by applying to technological tools and creating their own materials. The eighth week was all about how teachers improve their life and career skills.

On the other hand, the teachers showed what they have learned by creating their own teaching materials. For further use, printed documents were delivered and materials were shared online.

2- Do foreign language teachers' perceptions on preparing language-teaching materials change when they have in-service training involving 21st century skills?

To learn the effect of 21st Century Skills Material Design Teacher Training and Professional Development Program on teachers' perceptions, both quantitative and qualitative method were used. As it is not possible to measure teachers' competencies in this kind of research, the aim of the 39-item scale is to look at what teachers think, how they perceive their competencies and see if the 8-week teacher-training program has a positive effect on teachers' educational technology and material development perceptions. Thus, 33 participants answered Application-based Educational Technology and Material Development Competencies Scale before and after the teacher training. A paired samples t-test was conducted to compare the mean scores of pre-test and post-test of the scale. Analysis of data shows that all items of the 39-item scale have an increase. The maximum increase is in the 17th item, while the minimum increase is seen in the 5th item.

Accordingly, SPSS results indicate that this type of strategy training was found useful for developing teachers' perceptions regarding their educational technology and material development competencies on 21st century skills in the current study. In addition, the transcripts of structured interview, which are obtained from the teachers, were analyzed by using coding qualitative data technique, and the transcripts prove that the teacher training has a considerable influence on the teachers' perceptions.

3- How has 21st century skills teacher training influenced teachers' teaching/classroom practices?

Today, being a literate person means more than being able to read and write. Literate individuals use technology deliberately and effectively and can decide which media are most suitable for their communication goals. They also identify information needs, understand the structure of information, and evaluate information and its sources critically through various media and technologies. In this regard, teachers' in-service training incompetence should be eliminated. Thanks to this training, the teachers improved their creativity and created their own materials. They shared the materials they had prepared during the training and their own teaching practices on Google Classroom. In addition, their reflections in structured interview show that 21st century skills teacher training has influenced their teaching/classroom practices because they have started using 21st century digital skills in their own classes.

Structured Interview – Question 7: In your classes, have you applied to instructional materials and methods that you have learned in this teacher-training program? If so, could you share your innovative learning practices?

Reflections of the Teacher Training Program into Their Own Classes

During the teacher training, the teachers prepared their own materials about the topics they learned and shared them on Google Classroom. They also sent photographs and videos showing how they used these materials in their own classes.

<I have used “Plickers” to make a revision for my 4th grades... “Quiver” with my 2nd grades to let them talk about animals as well as to revise the colors and action verbs... “Bandicam” for my eTwinning project to record a video...>

<I shared my “Padlet” link so that students can practice listening skills and vocabulary.>

<Yes, I have applied “Plickers” ... I also used “Bandicam” in order to record my presentation on “PowToon”... My students’ “WordArt” experience was nice...>

<Yes, I used “Plickers” to check my students’ knowledge... “Bandicam” and “PowToon” in eTwinning project... “Quiver” for my 5th grades... I made presentations with “Prezi” and “Emaze”...>

4 | DISCUSSION & CONCLUSION

The present study was mainly designed to measure whether 21st Century Skills and Material Design Teacher Training and Professional Development Program increases teachers’, in-service training, and current teachers’ educational technology and material development competencies. In doing so, occupational experiences and observations, studies conducted by Cisco, Intel, Microsoft, and OECD have been considered.

The world has changed significantly, and the fundamental changes have influenced education field. This situation has brought a requirement for individuals. They need to think critically, solve problems, communicate, collaborate, find useful information quickly, and use technology efficiently. Technology has helped individuals to acquire these skills. Yet, the rapid evolving technology presents them various tools. Therefore, teachers have a big role in changing education environment. They should be able to evaluate instructional materials and choose the most appropriate tools for learners. They should include today’s popular materials such as Augmented Reality, Virtual Reality, and CALL materials with the purpose of providing motivation in class and permanence in learning. Findings of other studies have proved the value of these materials in education (Can & Şimşek, 2015).

On the other hand, Second Language Acquisition requires authenticity. Digital tools aid foreign language teachers to bring real life into classroom. Students should get experience with target language while learning a foreign language. 3D virtual learning environments and 360-degree videos have supported authenticity and conveyed the learning opportunities in the field of foreign language learning (Elia et al., 2017). Today, many schools have smart boards and internet access into classrooms, and great numbers of teachers have smart phones, tablets, and personal computers. When teachers are asked how they use technology in their classes, the answer should be more than showing a video on YouTube. There are a lot of computer-based educational programs or applications that can be also downloaded on mobile devices or tablets. In this regard, teachers' awareness should be improved, and they must be encouraged to be a technology literate person. This teacher training has been planned to bring 21st century skills to the teachers and later to the students through the teachers by using the technology effectively.

Having look at the current study, its interactivity is sound, as the teachers actively have participated in the teacher training; they have had the chance to prepare their own instructional materials. They have also learned how to use a tool they have used for any skill for another skill since all 21st century skills are integrated to each other.

SUGGESTIONS

In accordance with the analysis and attitudes of the teachers, qualitative and quantitative data results show that teacher-training programs in Turkey focus mostly on theory. Before the training, the teachers who had marked “I do not have” option on the scale, marked “I have” or “I absolutely have” options after the training. It also proves that there is a need for teacher training for current teachers in Turkey. Therefore, to eliminate this need in foreign

language education in Turkey, several recommendations need to be made. First, the number of computers, projectors and smart boards in schools should be increased. Language laboratories and material offices should be set up. Fatih Project, which provides computer, smartboard and projection device for schools and tablet for students, should be continued and these opportunities should be provided for every school. For current teachers, in-service training seminars should be organized. They must be encouraged to participate in projects conducted by eTwinning and Turkish National Agency.

As a last point to note, further studies can organize a teacher training for each skill of 21st Century Skills. Each title of these skills includes extensive knowledge. It is possible to find several digital tools and create diverse materials for each skill. In the current study, there were no technical problems since all teachers have smartphones and weekly lessons were done in a computer lab with internet access, and therefore other researchers must consider this to avoid any technical problems.

As this study is limited to 8-week training, a long-term training can be planned. The teacher training conducted by the researcher can be applied to the whole English teachers to get a deeper view. Planning a teacher training on 21st century skills and material design has never been done in Turkey until now. Similar studies can be done with more participants and different parts of Turkey.

LIMITATIONS

The study is limited to 8-week training. It is limited to 33 teachers working at public schools in Istanbul and voluntarily attending Istanbul Directorate of National Education Language Academy. After 8-week training, there is no access to classroom practice as to whether teachers use 21st century skills in their classroom. The study is limited to communicating to us that they use these skills.

STATEMENTS OF PUBLICATION ETHICS

We declare that the research has no unethical problems and observe research and publication ethics.

RESEARCHERS' CONTRIBUTION RATE

The study was conducted and reported by the corresponding author.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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