An Example Praxis for Teaching German as a Second Foreign Language with Augmented Reality Technology at Secondary Education Level

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Abstract

The developments in technology bring to mind the questions of how the acquisitions and contents of the curriculum in the foreign language teaching process can be transferred to the students in a more effective and permanent way and which methods and technological opportunities can be used in the education process, revealing that different perspectives and different methods should be used. In this context, the aim of this study is to create an exemplary digital instructional design to be used in teaching German as a second foreign language with augmented reality technology at the secondary school level and to evaluate the effectiveness of this design through a pre-test, a post-test, and in line with the opinions of the students participating in the application. In order to achieve this aim, one group pre-test-post-test design, which is one of the experimental designs, was preferred. A dependent groups t-test was used in the analysis of the data obtained in the single-group pre-test post-test design. The research group for the study consists of 20 9th grade students at Turgut Reis Anatolian High School in Muğla. In the study, semi-structured interview questions were prepared in order to determine the opinions of the students participating in the application on the use of technology in German lessons at the secondary education level. Descriptive analysis was used to analyse the data obtained by the interview technique. As a result of the study, it was seen that there was a significant difference between the pre-test and post-test scores of the students. It has been concluded that the students in the course where digital content is used through VR glasses show more progress and are more successful.

Keywords: Foreign language teaching, German teaching, Technology, Augmented reality, Secondary education.

Introduction

Innovative developments are taking place in technology day by day. These developments in technology offer various opportunities to education as well as to many fields such as health, tourism, engineering and communication. Therefore, in the 21st century, which is characterised as the age of digitalization depending on the diversity and efficiency of the possibilities offered by technology, it is no longer about access to information because it is very easy to access information; the idea of how knowledge will be permanent is gaining importance. This situation reveals the necessity of using different perspectives and different methods in a permanent way in the education process in general, and in the foreign language teaching process in particular, by bringing to mind the questions of how the achievements and contents of the curriculum can be transferred to the students in a more effective way and which methods and technological opportunities can be used in the education process. Many methods have been tried in foreign language teaching, initially traditional methods and then alternative methods, and the search for methods still continues today (Yıldırım-Aksöz, 2013; Darancık, 2008). The continuation of the search for this method is an indication that the desired success in foreign language teaching has not been achieved. As a matter of fact, in many studies in the literature, it has been stated that foreign language teaching in Turkey is not successful at the desired level (Aktaş, 2005; Balcı, 1997; 2012; Bayraktaroğlu, 2015; Karaman, 2016; Özdemir et al. 2017; Yılmaz & Yücel, 2020). This situation makes it necessary to evaluate and plan foreign language teaching from different perspectives, which is a comprehensive and multidimensional field that includes many emotional and cognitive factors, such as inadequacy of transferability to daily life, the curriculum, the student, the teacher, national language policies, methods, teacher competencies, teaching materials, cost allocated to foreign language teaching, learning situations, physical opportunities, families' attitudes towards foreign language, measurement and evaluation and mother tongue knowledge. In this context, integrating technology into the field, as the aim of this study is, can bring a solution in order to improve the foreign language teaching process and achieve the desired success. Thus, the effectiveness of education and training can be ensured by evaluating the

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opportunities offered by the current age with a different perspective on education and incorporating different technologies into this process. In the 2023 education vision, it is stated that digital content will be designed to support the development of language skills in the context of themes; and that opportunities will be provided for teachers to use digital resources for their qualifications and competencies (MEB, 2018, p. 69-70). As stated in the 2023 education vision created by the Ministry of National Education, the preparation of technology-based digital content in foreign language teaching has now become an indispensable need. With the development of technology, both the quantity and quality of technological opportunities in terms of serving different areas are also increasing. Different software, hardware, and devices are produced day by day. In addition, the interests and expectations of the target audience are not the same in every period, and the age at which they live is determinant in their interests and wishes. Depending on the changes in the stimulating environment and opportunities offered to the students by their current age, the way students acquire knowledge and skills may differ depending on the characteristics of the age in which they live. Digital environments will not be foreign to the Z generation, who were born in a digital world and have had many technological tools, especially smart phones, since infancy. Because the expectations of these students differed from the previous generations. Helmke (2009) considers the choice of method, taking into account the interests and expectations of the target audience, as a priority criterion in foreign language teaching, in order to convey the targeted content to the students. It is expected that the learning style of the Z generation, who grew up with technology, is widely technology and digital centred (Oblinger & Oblinger, 2005). Learning styles and forms may also differ depending on the changes in the areas that children growing up in the digital age enjoy and are interested in. Therefore, it is inevitable for educators to design learning environments with technological opportunities by taking this situation into account (Göçerler & Seyhan Yücel, 2021). Because, it is no longer possible to keep the interest and motivation of these students high with traditional methods, in which the method of presentation is at the forefront, by simply sticking to the textbook. Learning materials that have a higher sense of reality and perception compared to traditional course materials such as books or blackboards can also support the principle of proximity to life, which is one of the teaching principles, and contribute to the realisation of more effective and permanent learning. Therefore, with the inclusion of technological opportunities in foreign language teaching, the principle of proximity to life, which is one of the most important teaching principles, is also supported. The principle of proximity to life is reflected in the design of learning environments at school, which take their contents and materials from real life and select examples from natural life (Turan, 2019, p. 129). At this point, it becomes important to present the foreign language teaching designs to the students by associating them with real life. Because foreign languages have a feature that can be used in many aspects of life such as tourism, trade, international relations, hospitals, and markets, they are not considered a course that is only seen at certain hours and must be passed as planned in the curriculum (Karaman, 2018, p. 124). In other words, a foreign language, which is an abstract structure for the student, can be made more concrete and functional by finding a response in daily life. One way of embodying the abstract structure of a foreign language is the use of augmented reality technology in the foreign language teaching process. With this technology, it is possible to make the teaching programmes more functional. In this context, the concept of augmented reality is explained below.

Augmented Reality Technology

"Augmented reality is the live, direct or indirect physical view of the real world environment and its contents enriched with computer-generated sound, image, graphics and GPS data" (Büyükuygur & Güneş, 2018, p. 64). As Büyükuygur and Güneş stated, it is to strengthen the perception and understanding of the objects or environments in question by arranging and developing the real image of real objects or environments experienced by the person in real life in the computer environment. In other words, it is the enrichment of the objects or environments encountered in daily life through computers, some software, and hardware, and to serve education. Learning environments supported by augmented reality facilitate the process of acquiring skills, as this technology offers students the opportunity to gain experience (Punako, 2018). Augmented reality is beneficial to make the student feel as if they are in a real environment through a virtual environment, to create an experience different from the usual learning experiences, and to comprehend knowledge (Demirezen, 2019, p. 2). With this technology, the content is easier to remember because there is a learning environment in the form of a contextual pattern. 360-degree videos are produced using special cameras with multiple wide-angle lenses. Unlike traditional videos, which offer a very restrictive perspective, 360° video provides a spherical view with multiple viewing angles and perspectives. In addition, the content of 360° video is in a versatile format and can be computer generated or captured from the real world, and as a result users can view everything within camera range, creating more interactive, immersive, engaging and realistic experiences (Lampropoulos, et al., 2021). In addition, 360° video can adapt to existing pedagogical approaches and due to its immersive qualities, students perceive their physical presence in a virtual environment and thus become more involved in learning activities (Rupp, et al. 2016). In addition, 360° video positively affects students' emotional reactions to the learning environment. Ulrich, et al., 2021). 360° video enhances the sense of immersion as it provides users with spherical views and enables them to

interact and communicate with the virtual world around them (Ranieri, et al.,2020) and they feel a sense of presence within them, through the illusion that experience surrounds them perceptually. Hodgson, et al., 2019).

With augmented reality technology, the language learning process is realised in a natural environment without being aware of it. As in the mother tongue learning process, it supports the learner to learn in a real and natural flow in life. Thus, the student will be able to comprehend the language without being aware of it and will see the linguistic inputs as abstract material. With this technology, learning situations are created from real-life environments by associating the content in the curriculum with real-life environments, and this environment is transferred to the formal classroom environment. For this, technological tools and equipment such as smart phones and virtual reality VR glasses are used. This technology not only embodies the achievements in real life, but also makes the teaching process more economical. Because it is more costly and more risky in terms of security to take students to places related to the content of the course by using the excursion technique. A more economical learning and teaching process will be experienced as these environments will be brought to the classroom with VR glasses instead of taking the students in large groups to environments where target achievements are experienced. Since this technological design appeals to the senses such as sight and hearing, learning and teaching environments are strengthened depending on the student's learning by experiencing the content. Another contribution of augmented reality is that this technology allows the student to feel as if they are in real life, and focuses on the knowledge and skills that are intended to be learned by abstracting from external factors that will distract the student (Roussou, 2004).

There is much research on the use of augmented reality technology in the worldwide (Kavanagh, et al., 2017& Pierson, 2001&Ranieri, et al.,2020& Rupp, et al.,2016 & Singhal,2012). However in recent years, there have been some studies on the use of augmented reality in education in Turkey (Büyükuygur & Güneş, 2018; Değirmenci &İnel, 2020; Geriş & Tunga, 2020; İçten &Bal, 2017; Seçkin Kapucu & Yıldırım, 2019; Somyürek, 2014; Usta, et al. 2016).However, it is seen that most of these studies are in the form of theoretical and compilation (Kandemir & Atmaca Demir, 2020, p. 341). Therefore, it is seen as an important need to carry out applied studies that can be put directly at the service of teachers and students in schools and to develop instructional designs. In addition, while the studies on the use of virtual technologies in English teaching in Turkey are limited; (Kumkale &Adıgüzel, 2019, p. 230) no studies have been found in the literature on digital technologies such as the use of augmented reality in German teaching. The fact that technology-based educational materials are not used in schools at a sufficient level despite the development of technological tools (Kurt, 2014) clearly reveals this need in the field. In this context, in this study, a digital instructional design was created on a sample subject to be used in German teaching with an augmented reality application by integrating technology with German teaching.

As a result of the age at which students called Generation Z were born and grew up in different environments, their interest in virtual and digital objects differs from their teachers'. Students' interest in and desire for digital materials is higher than that of teachers. Therefore, the fact that teachers use only textbooks as teaching materials in the course is an ongoing problem for Turkey, which has not achieved the desired success in foreign language teaching. Depending on these technological opportunities offered by the age, the educational roles and duties of teachers have to be revised, restructured, and changed in accordance with digital transformation. One of these roles is the ability to be aware of technology and present these opportunities to teaching environments (Seyhan Yücel, 2020). Because there are inconsistencies between the learning styles of the students and the materials that will attract their attention, and the materials and stimuli adopted by the teachers and presented to the students. The inconsistency and conflict between the interests and wishes of the students and the teaching styles adopted and frequently used by the teachers take this process even further back. As a matter of fact, teachers who represent a higher generation compared to their students cannot understand the habits, interests, needs, and things they enjoy of the new generation that comes after them and grows up in different social textures (Uzun, 2012).

The Aim of the Study

The aim of this study is to create an exemplary digital instructional design to be used in teaching German as a second foreign language with augmented reality technology at the secondary school level and to evaluate the effectiveness of this design through pre-test and post-test in line with the opinions of the students that participated in the application. In order to determine the effectiveness of the digital instructional design developed at the end of the application, the efficiency of the digital content was evaluated in line with the opinions of the students using a semi-structured interview form consisting of six questions prepared by the researcher. In this context, the study consists of three stages. In the first stage, a German digital instructional design was created for the selected topic, in the second step, the instructional design was applied to the students in the school environment to determine the applicability of the developed digital instructional design; and in the third stage, the effectiveness of the German digital content was evaluated in line with the pre-test, post-test and students' opinions.

Method of the Study

Since both qualitative and quantitative data will be obtained in this study, a mixed method will be used. For this reason, the research is a mixed method research in which quantitative and qualitative research methods are used together. It is defined as an approach that includes the collection and analysis of qualitative and quantitative data, shapes it with theoretical foundations, and then combines the results obtained from the analyses for the purpose of understanding the mixed method research phenomenon (Creswell & Plano Clark, 2018).

In this study, one group pretest-posttest design, which is one of the experimental designs, was preferred. In this design, the researcher applies a pre-test to measure the dependent variable without interfering with the participants. The aim here is to measure the knowledge and skills level of the participants regarding the dependent variable. After the application, the final test is applied. Accordingly, a pre-test prepared by the researcher is applied to measure students' existing knowledge of the content intended in the instructional design. Afterwards, the post-test is administered after the instructional design is applied to the research group. In order to reveal the effectiveness of applications such as the curriculum, a conclusion is reached by considering the difference between the pre-test and post-test scores (Christensen, 2020, p. 258). Therefore, in order to measure the effectiveness of the digital instructional design developed in this study, an evaluation of the developed curriculum was made by calculating the results of the pre-test before the instruction and the post-test made after the instruction. In addition to the quantitative data obtained during the research, the study was also supported by qualitative data. Accordingly, the interview technique was used to determine the views of the students on the digital instructional design developed. Interviewing is a technique used to understand the experiences, feelings, thoughts, and attitudes of individuals towards a phenomenon or event (Yıldırım & Şimşek, 2008, p. 119). The effects of the German course, which was conducted using augmented reality technology with an interview technique, were investigated in line with the positive and negative opinions of the students. The ethics committee's approval of this study was obtained from the Social and Human Sciences Research Ethics Committee of a state university with the application numbered 210015.

Study Participants

In this study, 20 9th grade students studying at Turgut Reis Anatolian High School in Muğla were reached. The sample for the study was determined by the criterion sampling method, which is one of the purposeful sampling methods. Accordingly, some criteria were taken into account in determining the participants. These criteria are to be studying in the 9th grade at Anatolian High School, to be learning German as a second foreign language and to participate in the study voluntarily. At the beginning of the research, the participants were informed about the subject of the research, its purpose and the plans made regarding the implementation process.

Data Collection Tools

In this study, a pre-test was used to measure the knowledge of the students on the subject before the instructional design was applied; after the digital instructional design developed by the researcher was applied, three data collection tools were used: a post-test to measure the effect of the instructional design, and a semi-structured interview form to determine students' positive and negative views on digital content. The pre-test and post-test are two tests that reflect the achievements of the subject of "Einkaufen" (shopping) in the 9th grade German curriculum. They are prepared by the researcher and are similar in terms of the quality and quantity of the questions. At the end of the application, a semi-structured interview form is prepared to collect the experiences, thoughts and feelings of the students about the instructional design. This form consists of six questions.

Data Collection and Analysis

The data for the study were obtained face-to-face with the participants in the research group by using data collection tools and going to the school one-on-one by the researcher. A dependent groups t-test was used to analyse the data obtained in the single-group pre-test post-test design. The effect of the experimental procedure is obtained from the same participants with the same measurement tools, in the form of a pre-test before the application and a post-test after the application (Büyüköztürk, et al. 208). The t test is used to reveal whether the difference between the pretest and posttest mean scores is significant (Balcı, 2021, p. 250). The data obtained from the pre-test and post-tests were analysed using the SPSS 22 package programme. Descriptive analysis was used to analyse the data obtained by the interview technique. The data obtained in the descriptive analysis are described and explained regularly (Sözer & Aydın, 2020, p. 267).

Digital Instructional Design Preparation Process

This study aims to develop a digital instructional design to be used in teaching German using augmented reality technology. In order to achieve this aim, first of all, the themes in the 9th grade German curriculum and the contents under these themes were determined, and the concepts expected to be learned for each content were determined. In the 9th grade German lesson, the "Deutsch für Gymnasien" book at the A1.1 level prepared by the Ministry of Education is used as a source. In this book, there are 8 themes: "Information zur Person, Schule, Die

Gesellschaft, Tägliches Leben, Essen und Trinken, Besondere Tage, Freizeitaktivitäten, Einkaufen" and 27 contents under these themes. In this study, "Einkaufen", one of the eight themes in the book, was chosen as an example and a digital instructional design was developed using augmented reality technology. The contents of "Kleidungen, Einkaufszentrum, Die Geschäfte, Online einkaufen" and the words related to this content were determined under the "Einkaufen" theme chosen for the implementation phase of the research. First of all, a real-life scenario about this subject was written by the researcher. In the scenario, there are four people: Esra and Cansu, who are two sincere girlfriends; a salesperson working in the store; and a cashier. In the scenario, two close friends, Cansu and Esra, talked on the phone the day before. Esra needs to buy a birthday present for a friend. In Esra and Cansu's phone call, Esra asks Cansu if she can come to the mall with her to buy a birthday present for the weekend, and Cansu tells her that she will come to the mall to accompany Esra at the weekend. In the previous telephone conversation, clothes names such as "Einkaufszentrum" (shopping mall), "Rock" (skirt), "Hemd" (shirt), and "Hose" (pants), which are among the learning inputs of "Einkaufen" (shopping), were used deliberately. The aim is for students to hear these concepts in advance and to create awareness about them. While the script was being edited, "Wie geht es dir?" (how are you?), "Was ist los?" (What happened?) and "Ich habe ein Problem." were used. By using expressions such as (I have a problem), the students' prior knowledge of previous subjects was also activated. Therefore, students will have the opportunity to learn different and short German expressions, as the scenario is created by taking into account a possible flow while shopping in daily life while the scenario is being fictionalised. In the continuation of the scenario, Cansu and Esra meet at the shopping centre at the weekend and go to a clothing store to look at the clothes. In this scene, these selected communicative expressions -Wie findest du das Hemd?, (How did you find the dress?) Ich finde das Hemd sehr schön." (I found the dress very beautiful) Was hat deine Freundin gerne an? (What does your friend like to wear?) "Sie hat gerne Rock, Hemd, Kleid, Bluse, Hose an." (My friend likes to wear skirts, shirts, dresses, and blouses.) Wie viel kostet diese Schuhe? (How much are the shoes?), Es kostet fünfzig. (Shoes 50 TL), Esra, kaufst du gerne Online ein? (Esra, do you shop online?)" are used. Thus, the daily life equivalents of the target acquisition "Student expresses herself in German in relation to shopping in general" were provided to be experienced by the students. Afterwards, we went to the shopping centre, where the subject took place, for the shooting of the script, and the shooting started. With Esra and Cansu meeting at the shopping centre, the shootings in the shopping centre begin, and they go to a famous clothing store known in Turkey. The scenario is played out in accordance with the scenario previously set up by the researcher. In order to get a clear image, the shots are repeated more than once and the most suitable recording is taken for the montage. Separately created recordings are combined in a certain flow, resulting in a video of approximately five minutes. This video has been finalised by supporting the elements added to the video later, such as visual designs, sound effects, written German expressions, and colouring, as in the structure of augmented reality technology. As a result, digital content was created depending on the achievements of the subject selected from the 9th grade German curriculum. The digital content was created from interesting fictions that overlap with everyday language usage, reflect the truth, and are suitable for the level and needs of the target student group. Through the digital content produced, care was taken to highlight a certain communicative.

Practice of the Developed Digital Teaching Design
In this study, the digital instructional design developed using augmented reality technology was applied to 9th grade students studying at Muğla Turgut Reis Anatolian High School. The application was carried out in the German course and took a total of two course hours. The subject of "Einkaufen" from the German textbook named "Deutsch für Gymnasien", which is at the A1.1 level of the Ministry of National Education, was covered in one class hour within the framework of the explanations and exercises in the book. The researcher explained the subject according to the flow of the course book, which she reflected on with the smart board available in the classroom, and the lesson was continued with exercises in the form of filling in the blanks. Therefore, the only teaching material in the first lesson was the textbook and the smart board.

Figure 1. Lecture on the subject of "Einkaufen" (Akay Zabun, 2021, p. 82).
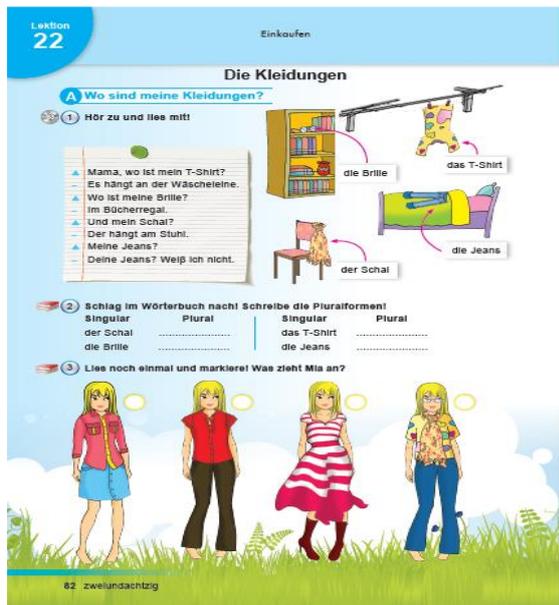
In the image above, an example of the content of the "Einkaufen" subject in the book "Deutsch für Gymnasien, Schülerbuch Niveaustufe A1.1 to be used in German as a second foreign language lesson by the Ministry of National Education is given. As can be seen above, pictures of clothes such as trousers, shawls and skirts are given in this textbook, and a German dialogue has been prepared including the clothes in these pictures. According to the instructions in the book, this dialogue is first listened to from the audio file, and then the students are allowed to read it together with the teacher in the classroom. The flow in the book continues with the plural forms of the same clothes given in German, and finally, the students are asked a question about what the girl named Mia is wearing, and they are asked to mark the correct one from the image dressed in four different ways. The researcher applied the flow in the textbook as given as an example. After the lecture process was finished by the researcher, a pre-test was applied in order to determine the level of acquisition by the student of the learning outcomes of the course, which were based on the textbook. Afterwards, the lesson was interrupted for a week before the designed instructional design was implemented. After a one-week break, the second lesson hour, in which the developed digital instructional design was put to work, started. In this course, first of all, the participants were informed about how to do the application and the technological materials to be used in the course. VR glasses and smart phones were used as technological materials. Each student was given a VR glasses during the pre-preparation phase of the lesson. The prepared digital content was shared with the students via smart phones and transferred to the VR glasses given to each student. After the VR glasses were given to the students, it was observed that their interest in and desire for the lesson increased. The digital instructional design that students experience with VR glasses takes approximately 5 minutes. During the practise process, the students were watched twice because they wanted to experience the digital content more than once. When students put on VR glasses, they felt as if they had left the classroom and were in a shopping mall. Even though all students are in the classroom environment, external factors such as having an extracurricular interaction with their classmate, which creates a negative atmosphere that will negatively affect the learning environment, as each student experiences being in a different place with VR glasses, are avoided. Below is the digital content link and screenshots of this digital content.
Digital content link: https://www.youtube.com/watch?v=oUp9XBFVyF8

Photograph 1. A screenshot from digital content

As can be seen from the screenshot taken from the digital content above, two friends are looking at clothes in a clothing store, and they talk about the subject such as "ich kann Hose, Schal, Kleid, Rock und Hemd kaufen".

Photograph 2. A section from the shooting of the digital content scenario

As can be seen from the screenshot above, almost all possible life shopping situations in digital content have been animated and the abstract learning inputs have been embodied through the scenario. German expressions and linguistic uses in digital content are both voiced and written. Thus, students were able to experience both the pronunciation and writing of German expressions.

Photograph 3. An image from the application made with virtual glasses

Above is an image of the practice made with virtual glasses in the classroom environment. Students were able to experience the digital content that they could watch in three dimensions, regardless of the environment. Each student wearing virtual glasses had the opportunity to go out of the classroom and take a tour as if they were actually shopping in a shopping mall. Since the teaching process gains individuality after virtual glasses are put on, the possibility of experiencing other undesirable behaviors outside the classroom will be prevented. In this application, every student now has to focus on the content they encounter. Afterwards, a post-test was administered to the participants. Findings related to the study are presented below.

Findings
Normality Assumption
When the normality assumption, which must be met for the method to yield valid results, is examined, it is seen that the test results have a normal distribution according to the Shapiro-Wilk test in all combinations of the groups.

Table 1. Normality test

	Shapiro-Wilk		
	Statistic	df	Sig
Pre-Test	,912	20	,069
Post-test	,944	20	,286

- For Pre-Test Scores: Statistic value= ,912; df=25; Significant Value= ,069
- For Post Test Scores: Statistic value= ,944; df=25; Significant Value= ,286

The assumptions of the dependent group t-test were tested in order to decide whether to use parametric tests in the tests related to the findings of the use of augmented reality application in German teaching. The first assumption is "Do the groups show a normal distribution?" For this, the Shapiro-Wilk test was used. When the table 1 given above is examined, p(pretest)=0.069>0.05; Since p(posttest)=0.286>0.05, it can be said that both groups are normally distributed. The second assumption is that the pre-test and post-test are administered to the same group of students, so it can be said that the groups are dependent. Since the above-mentioned assumptions were realised in the research, the t-test, which is a parametric test, was used for dependent groups in the comparison of the pre-test and post-test averages. The dependent group t test result is given in the table below. Accordingly, since p<0.01, it can be said that there is a high degree of difference between the pre-test and post-test.

Table 2. Arithmetic mean, standard deviation and t-test results of pre-test and post-test scores

Measurement	N	Mean	S	t	p
Pre- Test	20	43,00	10,310	17,667	0,000
Post Test	20	69,50	9,986		

Statistical Evaluation of Pretest and Posttest Scores

As seen in Table 2, it was observed that there was a difference between the pre-test and post-test scores of the students. It was concluded that the post-test average score of the students was higher. It was observed that the difference in success in the post-test scores in the German course in which the instructional design developed using augmented reality technology was applied; was significantly higher than the difference in success in the pre-test scores in the German course taught using the textbook. According to these results, it has been determined that the students in the course where digital content is used through VR glasses show more progress and are more successful.

Evaluation of Student Views on the Practise

After the designed digital instructional design was applied to the participants, semi-structured interviews consisting of six questions were held in order to get the opinions of the students about the application. The interviews were analysed using the descriptive analysis method.

The data obtained in the study; including "positive and negative opinions about the German lesson using virtual glasses, the preference of teaching German lessons from the book in the traditional sense or using virtual glasses, the contribution of the use of virtual glasses to increase the interest and desire for German, other German subjects to be explained with virtual glasses, the virtual content to be catchy, and the wearing of virtual glasses to make you feel the reality" were grouped under six themes. These themes are schematized in the tables below.

Table 3. Student views on the German lesson used virtual glasses

Theme	Categories	Subcategories	F
THEME 1 Student views on the German lesson used virtual glasses	1.1. positive opinions	1.1.1. Effective	4
		1.1.2. More understandable	4
		1.1.3. Good	7
		1.1.4. Enjoyable	6
		1.1.5. A different app	3
		1.1.6. Productive	7

| | 1.2. negative opinions | 1.2.1. Glasses are headache | 2 |
| | | 1.2.2. An unnecessary app | 3 |

Participants expressed positive opinions about the sample German lesson conducted using virtual glasses describing it as " - effective, more understandable than traditional lessons, nice, fun, efficient, and different in application. Two participants stated that glasses give them a headache, and three participants stated that they were an unnecessary application. In general, according to the opinions of the participants, it is understood that the use of augmented reality technology in German lessons has more positive effects on German teaching. Participants expressed their opinions as follows:

> K1: "It was educational and fun. It was my first time using virtual glasses and I liked it."
> K9: "I loved the German lesson we did using virtual glasses. It was a fun lesson."
> K2: "I found the lesson with virtual glasses nice, but virtual glasses gave me a headache."
> K16: "I found it nice, teaching using technology allows us to learn more."

As it is understood from the students' opinions given above, the virtual glasses used for the first time in the lesson are fun and instructive, the achievements of a German lesson integrated with technology are higher than the achievements of the German lesson, which is carried out with the textbook in the centre, but it was stated that wearing the virtual glasses for a long time causes headaches in the student.

Table 4. Preference for German lessons to be taught from a book or using virtual glasses

Theme	Categories	F
THEME 2 Preference for German lessons to be taught from a book or using virtual glasses	2.1. It should be told from the textbook	6
	2.2. Virtual glasses should be used	14

In the interview, the question "Do you prefer the German lesson to be taught from the book or using virtual glasses?" was asked. While 14 participants preferred to use virtual glasses in the lesson; 6 participants stated that they prefer to teach German lessons using books. Participants expressed their opinions as follows:

> K2: "German lessons should be taught with virtual glasses. Because with virtual glasses, it is more memorable."
> K3: "From the book, because wearing glasses all the time can spoil our eyes.
> K7: "I prefer it to be told through virtual glasses. Because I find it beautiful, fun and educational."
> K18: "I would like it to be done with virtual glasses. Because doing such things in the lesson makes me more interested in the lesson."

In general, the participants stated that they preferred the use of virtual glasses in German lessons because the content and achievements of the lesson conducted using virtual glasses are permanent, the lesson is fun, educational and interesting. On the other hand, 6 participants stated that they think that it is better to conduct the lessons from the book, citing that virtual glasses can negatively affect the health of the eyes.

Table 5. The contribution of the use of virtual glasses to the increase of interest and desire for German

Theme	Categories	F
THEME:3 The contribution of the use of virtual glasses to the increase of interest and desire for German	3.1 it contributed	13
	3.2. it did not contributed	7

13 participants stated that the use of virtual glasses in German lessons contributed to the increase of their interest and desire for learning German; on the other hand, 7 participants stated that virtual glasses did not contribute to their interests and wishes regarding the German course. Participants expressed their opinions as follows.

K3: "Yes, my interest has increased, now I remember what I saw in virtual glasses in German lessons".

K11: "No, because I am already interested in German".

K6: Yes. The experience of using virtual glasses in German class was nice."

As it can be understood from the statements above, it was emphasized that the digital content watched through virtual glasses is easier to remember, thus increasing the motivation of the participants to learn German. From the opinions of the participants, it is understood that the use of virtual glasses has a positive contribution to the students' interest in and desires for German.

Table 6. Explaining other German subjects with virtual glasses

Theme	Categories	F
THEME 4. Explaining other German subjects with virtual glasses	4.1.Yes	12
	4.2. No	8

In another question, the participants were asked whether they wanted other German subjects to be explained with virtual glasses as well. While 12 participants gave a positive answer to this question, 8 participants gave a negative answer. Participants expressed their opinions as follows:

K2: "Yes, I would like other German subjects to be explained with virtual glasses. Because, thanks to visuals, memorability increases."

K5: "No, I don't would like. Because glasses hurt my eyes."

K9: "I would like to, because virtual glasses are better, more interesting and more fun than the board and the book."

In terms of positive aspects such as the presence of visual content in virtual glasses that is interesting and fun, based on the above statements, the participants wanted other subjects of German to be explained with virtual glasses; however, it is understood that they do not want this method to be used in the teaching of other subjects since the glasses hurt the eyes.

Table 7. To be memorable of virtual content

Theme	Categories	F
THEME 5. To be memorable of virtual content	5.1.memorable	14
	5.2. not permanent	6

As it can be understood from the table above, 14 participants stated that the digital content is permanent and 6 participants expressed their thoughts that it is not permanent. Participants expressed their opinions as follows:

K 7: "Yes, because I watched it with virtual glasses."

K14: I think it's catchy because it's attractive, so it's easier to remember."

K1: "It was not catchy in my opinion because it was difficult to understand because our German level was not good."

The majority of the participants supported the catchy nature of digital content as virtual glasses attract their attention; the participants, who thought that the digital content was not catchy, attributed this negative opinion to their poor level of German.

Table 8. The feeling of reality by wearing virtual glasses

Theme	Categories	F
THEME 6 The feeling of reality by wearing virtual glasses	6.1.Yes	12
	6.2. No	8

In another question, participants were asked whether they felt like they were watching digital content in the shopping mall when they wore the virtual glasses. 12 participants stated that they felt like they were in a real

environment when they watched digital content; 8 participants stated that the feeling of being in the real environment did not occur. Participants expressed their opinions as follows:

> K19: *"I felt like I was shopping. Because it was a real environment that we watched through glasses."*
> K1: *"I felt it. Because it was three-dimensional."*
> K9: *"No, I didn't feel it because there was noise in the classroom."*

As it can be understood from the statements of the participants above, it is understood that the participants felt as if they were having an experience in real life, for reasons such as shooting digital content in a real environment and being three-dimensional. Therefore, it can be said that digital content creates a perception of reality.

Results and Discussion

In this study, an exemplary digital instructional design was created to be used in teaching German as a second foreign language with augmented reality technology at the secondary education level. It was applied in the 9th grade at Anatolian High School, and the effectiveness of this design was evaluated in line with the pre-test, post-test, and students' views on the digital instructional design developed by the researcher. In order to determine the effectiveness of the instructional design in the research, the students were first given a pre-test before the application, and then the 9th grade students were taught German with the instructional design prepared using augmented reality technology. At the end of the practise, a post-test was administered to determine the effectiveness of the application. It was observed that the difference in success in the post-test scores in the German course in which the instructional design developed using augmented reality technology was applied was significantly higher than the difference in success in the pre-test scores in the German course taught using the textbook. According to these results, it has been determined that the students in the course where digital content is used through VR glasses show more progress and are more successful. In many studies, it was concluded that the academic achievement of students increased as a result of interactions with VR technologies (Bacca, et al.,2014 & Chiang, 2014). In addition, it was concluded that the post-test arithmetic mean score of the students was higher than the pre-test arithmetic mean score. In the study, not only quantitative data but also qualitative data were obtained. In a study conducted in Switzerland on the usability of augmented reality technology in the classroom environment, it has been shown that augmented reality technology products can be used without restricting the class in other courses and or hindering the teaching of the course (Cuendet, et. Al.,2013). Therefore, after the designed digital instructional design was applied to the participants, semi-structured interviews consisting of six questions were conducted in order to get the opinions of the students about the application. According to the findings obtained from these interviews, positive opinions were expressed that the use of virtual glasses in German lessons is fun, instructive, effective, more understandable than traditional lessons, and that it is a beautiful, efficient, and different application; it was also stated that wearing virtual glasses for a long time causes headaches and eye deterioration in students. The course may have been evaluated as enjoyable and instructive by the students, since they generally use virtual glasses while playing digital games in their social lives and the digital content is shot in a real environment. The fact that long-term exposure to glasses can negatively affect the student' health can be considered a negative effect of this practise.

The majority of the participants stated that virtual glasses make digital content more appealing because they attract their attention. It can be said that digital content increases the motivation for learning German, since digital content watched through virtual glasses is easier to remember. In the study on the effect of augmented reality on the motivation of students at the secondary school level in Spain, it was concluded that students' attention, interest, confidence and satisfaction towards the lesson increased (Di Serio, et al.,2013). While the participants stated that they wanted other subjects of German to be explained with virtual glasses, they stated their reasons as having visual content in virtual glasses, being interesting, and being entertaining. Therefore, not only in 9th grade German teaching, it can be concluded that augmented reality technology can be used at other school levels as well. Because the participants stated that they would prefer to use virtual glasses in German lessons because the content and achievements of the lesson conducted using virtual glasses are permanent and the lesson is fun, educational, and interesting. Educational virtual reality applications help students increase their learning performance (Lin et al., 2013).

Another result of the study is that the participants felt as if they were having a real-life experience, due to the fact that the digital content was shot in a real environment and is three-dimensional. Therefore, it can be said that the application of augmented reality contributes to the association of the abstract foreign language teaching process with real life by embodying it, and accordingly, the language has become a structure that has a function in real life, rather than just a set of passive rules. Since the teaching activity, which is traditionally carried out by adhering only to the textbook, does not enable the student to acquire the achievements by experience, the content given to the student remains only in short-term memory, and the information cannot be transferred to the long-term

memory because the student cannot experience enough experiences regarding the course content in this process, therefore, full learning cannot take place. In this context, the use of augmented reality applications in German teaching can provide important contributions to the teaching process.

The second foreign language teaching process should be supported by including technological opportunities in the teaching process instead of the German lessons being only textbook-centered as in the traditional foreign language lessons.

Having technological devices such as computers and smart boards in schools is not sufficient for teachers to use this technological infrastructure. In order to serve this technological education, it is an important requirement to provide training to educators so that they can integrate pedagogical and field knowledge with the opportunities provided by technology (Bostancıoğlu, 2017: 93). Therefore, in-service training within the scope of TÜBİTAK projects should be organised for teachers regarding the use of technology in German teaching. Considering the methods, techniques, and teaching materials used in the teaching process and the opportunities offered to generation Z by the environment in which they were born and grew up, digital content should be presented to them depending on the change in their interests and desires.

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Ethical Approval
Ethical permission (05.11.2021) was obtained from the Social and Human Sciences Research Ethics Committee of a state university with the application numbered 210015.

References

Akay Zabun, O. (2021). *Deutsch für Gymnasien, Schülerbuch Niveaustufe A1.1,* Ankara: Ata Yayıncılık.

Aktaş, T. (2005). Yabancı Dil Öğretiminde İletişimsel Yeti. *Journal of Language and Linguistic Studies*, sayı 1, 89-100.

Bacca, J., Baldris, S., Fabregat, R., Graf, S., & Kinshuk. (2014). Augmented reality trends in educaiton: a systematic review of research and applications. *Educational Technology & Society*, 133-149.

Balcı, T. (1997). Das Germanistik-bzw. DaF-Studium in der Türkei. *Informationen Deutsch als Fremdsprache*, 5/24, 621-624.

Balcı, T. (2012). Ein Überblick über Deutsch als Fremdsprache in der Türkei. *Tribüne*, 4, 3-6.

Balcı, A. (2021). *Sosyal Bilimlerde Araştırma Yöntem, Teknik ve İlkeler*. 15. Baskı, Ankara: Pegem Akademi.

Bayraktaroğlu, S. (2015). *Türkiye'de Yabancı Dil Eğitimi*. Ankara: Öğretmen dünyası Yayınevi.

Bostancıoğlu, A. (2017). Teknolojinin Dil Öğretiminde Kullanımı: Lisans Seviyesinde Verilen Bir Bilgisayar Destekli Dil Öğretimi Dersinden Yapılan Çıkarımlar. *Turkish Studies*, 12 (6), 89-102.

Büyüköztürk, Ş. & Kılıç Çakmak, E. & Akgün, Ö. E. & Karadeniz, Ş. & Demirel, F. (2020). *Eğitimde Bilimsel Araştırma Yöntemleri*. 29. Baskı, Ankara: Pegem Akademi.

Büyükuygur, M. &Güneş, A. (2018). Artırılmış Gerçeklik Teknolojisinin Yabancı Dil Eğitiminde Kullanımı ve Eğitsel Oyun Geliştirilmesi. *Eğitim ve Öğretim Araştırmaları Dergisi*, 7(4), 63-73.

Chiang, T. H., Yang, S. J., & Hwang, G. J. (2014). An augmented reality-based mobile learning system to improve students' learning achievements and motivations in natural science inquiry activities. *Journal of Educational Technology & Society,* 17(4), 352.365.

Christensen, Larry B. & Johnson, R. Burke & Turner, Lisa A. (2020). *Araştırma Yöntemleri Desen ve Analiz.* (çev. Ed. Ahmet Aypay), 3. Baskı, Ankara: Anı Yayıncılık.

Cuendet, S., Bonnard, Q., Do-Lenh, S., & Dillenbourg, P. (2013). Designing augmented reality for the classroom. *Computers & Education*, 68, 557-569.

Creswell, J. W., Plano Clark, V. L. (2018). Designing and conducting mixed methods research (3rd ed.). Sage.

Darancık, Y. (2008). İkinci Yabancı Dil Öğretiminde Alternatif Yöntemlerin Almanca Edebi Metinlerle Uygulanması. Doktora tezi, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü, Adana.

Değirmenci, N. & İnel, Y. (2020). Sosyal Bilgiler Öğretim Programına Yönelik Mobil Artırılmış Gerçeklik Uygulamalarının Öğretmen Adaylarıyla Geliştirilmesi: Bir Eylem Araştırması, *Journal of Innovative Research in Social Studies*. 3(2), 90-113.

Demirezen, B. (2019). Artırılmış Gerçeklik ve Sanal Gerçeklik Teknolojisinin Turizm Sektöründe Kullanılabilirliği Üzerine bir Literatür Taraması. *Uluslararası Global Turizm Araştırmaları Dergisi*, 3(1), 1-26.

Di Serio, Á., Ibáñez, M. B., & Kloos, C. D. (2013). Impact of an augmented reality system on students' motivation for a visual art course. *Computers & Education,* 68, 586-596.

Geriş, A.& Tunga, Y. (2020). Sanal Gerçeklik Ortamlarında Bulunma Hissi. *Manisa Celal Bayar Üniversitesi Sosyal Bilimler Dergisi,* 18 (4), 261-282.

Göçerler, H. & Seyhan Yücel, M. (2021):Lernspielapps - Potentiale für die Erweiterung und Verfestigung des deutschen Wortschatzes: Eine Aktionsforschung ,Balcı, T. / Öztürk, A. O & Aksöz, M. (Ed.). *Schriften zur Sprache und Literatur V*. Konya: Çizgi Kitabevi Yayınları, 235-255.

Helmke, A. (2009): *Unterrichtsqualität und Lehrerprofessionalität. Diagnose, Evaluation und Verbesserung des Unterrichts*. Seelze: Klett-Kallmeyer Verlag.

Hodgson, P., Lee, V. W., Chan, J. C., Fong, A., Tang, C. S., Chan, L., & Wong, C. (2019). *Immersive virtual reality (IVR) in higher education: Development and implementation. In Augmented reality and virtual reality* (pp. 161–173). Springer.

İçten, T. & Bal, G. (2017). Artırılmış Gerçeklik Üzerine Son Gelişmelerin ve Uygulamaların İncelenmesi. *Gazi Üniversitesi Fen bilimleri Dergisi*, 5(2), 111-136.

Kandemir, C & Atmaca Demir, B (2020). Eğitimde Sanal Gerçeklik Uygulamaları Üzerine: "Sınıfta Ben De Varım" Projesi. *The Turkish Online Journal of Design, Art and Communication – TOJDAC*, 10(4), 339-354.

Karaman, F. (2018). *Kısa Süreli Dil Öğretimi İçin Pratik Bir Dil Öğretim Modeli*. II. Uluslararası Eğitim Araştırmaları ve Öğretmen Eğitimi Kongresi, Tam Metin Bildiri Kitabı, ed. Bostancı, Aynur B. & Koçak, Seval, 13-15 Eylül Aydın, s. 121-126.

Karaman, F. (2016). Yabancı Dil Olarak Almanca Dersinde Dilbilgisinin Dört Beceriye Aktarımı ve Kullanımına Yönelik Örnek Bir Uygulama, *Diyalog*, 2, 92-103.

Kavanagh, S., Luxton-Reilly, A., Wuensche, B., & Plimmer, B. (2017). A systematic review of Virtual Reality in education. *Themes in Science and Technology Education*, 10(2), 85-119.

Kumkale, Z., Adıgüzel, A. (2019) İngilizce Öğretiminde Sanal Gezinti (Virtual Tour, Virtual World) Uygulamaları İle İlgili Yurtdışı Lisansüstü Tezlerin Değerlendirilmesi. *The Journal of International Lingual Social and Educational Sciences,* 5(2), 229-238.

Kurt, S. (2014). Creating Technology-enriched Classrooms:Implementational Challenges in Turkish Education. Learning. *Media and Technology*, 39(1), 90-106.

Lampropoulos, G., Barkoukis, V., Burden, K., & Anastasiadis, T. (2021). 360-degree video in education: An overview and a comparative social media data analysis of the last decade. *Smart Learning Environments,* 8(1), 1-24.

Lin, T. J., Duh, H. B. L., Li, N., Wang, H. Y. ve Tsai, C. C. (2013). An investigation of learners' collaborative knowledge construction performances and behavior patterns in an augmented reality simulation system. *Computers & Education*, 68, 314-321.

MEB, (2018). 2023 Eğitim Vizyonu, erişim adresi: http://2023vizyonu.meb.gov.tr/doc/2023_EGITIM_VIZYONU.pdf. Erişim tarihi: 4.10.2021.

Oblinger,D.,and Oblinger, J. (2005). Is it age or IT: First steps toward understanding the net generation. *Educating The Net Generation*, 2(1-2), 20.

Özdemir, A. & Demir, K.; Özkan, T. Y. & Arkılıç Songören, S. (2017). Türkiye'de İngilizce ve Almanca Öğretimi ile Türkçe Öğretimi, *International Journal of Languages' Education and Teaching*, 5/4, 595-610.

Pierson, M. E. (2001). Technology Integration Practice as a Function of Pedagogical Expertise. Journal of Research on Computing in Education, 33(4), 413-430.

Seçkin Kapucu, M.& Yıldırım, İ. (2019). Türkiye'de Sanal ve Artırılmış Gerçeklik Üzerine Eğitimde Yapılan Çalışmalara İlişkin Metodolojik Bir İnceleme. *Akademikbakış Dergisi*, 73, 26-46.

Seyhan Yücel, M. (2020): *Sprachliches Handeln Für ‚Fertigkeit Sprechen' In Der Deutschlehrerausbildung Mit Unterstützung Der Digitalen Medien,* Schriften zur Sprache und Literatur IV, IJOPEC Publication No: 2020/5, 77-88.

Singhal, S., Bagga, S., Goyal, P., & Saxena, V. (2012). Augmented Chemistry: Interactive Education System. *International Journal of Computer Applications*. 49(15), 1-5.

Somyürek, S. (2014). "Öğrenme Sürecinde Z Kuşağının Dikkatini Çekmek: Artırılmış Gerçeklik". *Eğitim Teknolojisi Kuram ve Uygulama*, 4(1), 63-80.

Sözer, Y.& Aydın, M. (2020). *Nitel Veri Toplama Teknikleri ve Nitel Veri Analizi Süreci,* içinde Kuramdan Uygulamaya Eğitimde Bilimsel Araştırma Yöntemleri (ed. Behçet Oral& Ahmet Çoban, Ankara: Pegem Akademi, (s.249-283).

Ranieri, M., Bruni, I., & Luzzi, D. (2020). Introducing 360-degree video in higher education: An overview of the literature. Human and Artificial Intelligence for the Society of the Future.

Roussou, M. (2004). Learning by doing and learning through play: An exploration of interactivity in virtual environments for children. *Computers in Entertainment,* 2(1), 1-23.

Rupp, M. A., Kozachuk, J., Michaelis, J. R., Odette, K. L., Smither, J. A., & McConnell, D. S. (2016).The effects of immersiveness and future VR expectations on subjective-experiences during an educational 360 video. *In Proceedings of the human factors and ergonomics society annual meeting* (Vol. 60, pp. 2108–2112). SAGE Publications.

Punako, R. (2018). *Computer-Supported Collaborative Learning using Augmented and irtual Reality in Museum Education*, (Published Dissertation Thesis), College of Engineering and Computing Nova Southeastern University.

Turan, M. (2019*). Öğrenme – Öğretme İlkeleri* içinde Öğretim İlke ve Yöntemleri Ed.

Saracaloğlu, Asuman Seda & Küçükoğlu, Asuman, 4. Baskı, Ankara: Pegem Akademi, s.125-141.

Ulrich, F., Helms, N. H., Frandsen, U. P., & Rafn, A. V. (2021). Learning effectiveness of 360 video:

Experiences from a controlled experiment in healthcare education. *Interactive Learning Environments*, 29(1), 98–111.

Usta, E. & Korucu, A. T.& Yavuzarslan, İ. F. (2016). Eğitimde Artırılmış Gerçeklik Teknolojilerinin Kullanımı: 2007-2016 Döneminde Türkiye'de Yapılan Araştırmaların İçerik Analizi, *Alan Eğitimi Araştırmaları Dergisi*, 2(2), 84-95.

Uzun, L. (2012). The Internet and Computer Enhanced Foreign Language Learning and Intercultural Communication. *World Journal on Educational Technology,* 4(2), 99-112.

Yıldırım, A. &Şimşek, H. (2008). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri,* 7. Baskı, Ankara: Seçkin Yayıncılık.

Yıldırım Aksöz, M. (2013). Produktionsorientierter Literaturunterricht: Einübung der Literaturgattung Schwank Durch Waldmanns Phasenmodell. Ankara: *Turkish Studies*, 8/8 Summer, 1503-1521.

Yılmaz, H., E. Yücel E., Öztürk, M.S. (2020). *Yabancı Dil Öğretimine Genel Bir Bakış* IV. Konya: Çizgi.