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THOUGHTS OF ACADEMICS ON THE USE OF MOBILE AUGMENTED REALITY IN TOURISM EDUCATION: THE CASE OF ESKISEHIR[1]

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ABSTRACT

Human resource in the tourism sector is critical enough to shape the future of the sector. The opinions of academics are extremely important in the use of any new product, method and process that will lead to the development of human resources. In this sense, the role of academics is particularly important in enhancing the qualifications of students and the education given to them. In line with this, the aim of this research is to reach the views of the tourism academicians who work in tourism faculties regarding the use of mobile augmented reality technology in tourism education. For this purpose, the research was carried out with the use of qualitative methods. In the method part of the research, one-to-one interviews were conducted with 15 academics working in the tourism faculties of Anadolu University and Eskisehir Osmangazi University using a semi-structured interview form. The answers obtained were transcribed by the researcher and interpreted under four themes: strengths, weaknesses, opportunities and threats by applying content and frequency analysis. It has been stated by tourism academics that mobile augmented reality applications offer opportunities for the development of tourism education and therefore the development of the sector.

1. Introduction

Tourism, which is growing day by day, has started to overshadow even the major oil trades in the world with the income it generates. Tourism today presents itself among the world's leading industries (Singh, 1997, p. 299). The tourism sector continues to be the sector on which developed and developing countries carefully focused. The most important reason why tourism has this characteristic is its rapid growth (Yıldız, 2011, p. 54). Tourism industry or hospitality industry, as it is called, is one of the most important sectors of the world countries with its economic gains and employment opportunities (Pizam and Shani, 2011, p. 76).

The main source of any tourism-related organization, regardless of its national borders, is the de facto employees of the organization. The quality of the staff reflects the quality of the organization. Finding the right staff undoubtedly is one of the biggest challenges to organizations (Leslie and Richardson, 2000, p. 489). According to Haven-Tang and Jones (2008, p. 353), tourism is a labour-intensive sector, and customer-employee communication is an important determinant of quality. Running the right staff in the right place at the right time, is critical to quality management. According to Hawkins (1998, p. 82), as a result of the increasing use of technology in the tourism sector, it is necessary and important to employ skilled, trained and qualified personnel in the use of technological devices and software in the sector.

The integration of technology into education has become an important topic of study in the current era. According to Pierson (2001, p. 427), technology integration in education is defined as facilitating the student's learning process by combining the teacher's knowledge of technology with the pedagogical knowledge s/he possesses. For Robinson (2008, p. 2130), the integration of technology into education is an integral part of a comprehensive education reform. Technology integration covers many different topics. Technology alone cannot help a student achieve learning goals, but it is a factor that offers great opportunities in facilitating the path to learning goals. According to the report of the United States' Department of Education (U.S. Department of Education, 2010, p 10), the use of engaging and personalized modern technologies in education that reflect students' daily lives and futures is a must.

Augmented reality (AR) is a technology in real-time, based on real-world perception, where virtual information is added as an extra layer. Augmented reality can technically be used to enhance all five

senses, but its most common use is visual. The added virtual layer sometimes consists of sound, 3D objects, 3D scenes or is composed only of textual information (Loijens, 2017, p. 14). Azuma (1997, p. 356) defines augmented reality as any system with the following three properties; To be able to combine reality and virtual, to be able to work in real-time and interactively, to be able to work in 3D. It is thought that the mobile use of augmented reality technology, which has found a wide range of uses in different sectors and achieved positive outcomes, has great potential in tourism education as well. This research aimed to reach the views of tourism academics regarding the use of mobile augmented reality technology in tourism education.

2. Literature Review

2.1. Tourism Education

Strengthening the understanding that human resources are crucial to shaping the future of a society leads to increased efforts to improve the quality of education and training (Ural and Pelit, 2002, p. 219). Education is critical in developing the country's economy. Labour force, within the factors of production, can only be strengthened by a well-trained human resource (Kızılırmak, 2000, p. 192). The service industry in which tourism is involved is distinguished from other industries with some obvious differences. For example, the product comes across as an abstract concept in the service industry unlike other industries. Such differences make the quality of human resources even more important in service industries. The nature of the product increases the importance of human resources education (Lee-Ross and Pryce, 2010, p. 6).

When the local and foreign literature is examined regarding tourism education, the main subject to be explained is vocational education. Vocational education is a process that aims to give people the knowledge, skills and abilities they will use in their future professional lives (Hacıoğlu, 1992, p. 91). The main objective of vocational tourism education is to develop and train a student who will be able to be a manager in the sector after they graduate from a tourism program (Pauzé, 1993, p. 61). Tourism education focuses on the process that aims to gain the necessary skills to understand and analyse, interpret and evaluate the principles of tourism. Tourism education enhances student's abilities, enabling them to learn conceptual issues to contribute to their professional and intellectual development (Cooper and Shepherd, 1997, p. 35).

It is claimed that human resources are of great importance in the production and delivery of services within tourism enterprises and that human resources within the tourism sector play a key role in the success and long life of the enterprises (Lohmann and Jafari, 1995, p. 491; Baum and Szivas, 2007, p. 1). The concept of quality improvement in an increasingly competitive environment has become an important issue for the tourism sector.

There is an accurate proportional relationship between the success of the sector and the quality of the services offered (Augustyn and Ho, 1998, p. 75). Human resource is one of the most important parts of tourism enterprises and is the basic thing for developing the tourism sector. Increasing the quality of human resources through training can help them gain competitiveness (Mayaka and King, 2002, p. 112).

Jenkins (1997, p. 216) states that businesses in the tourism sector in any country in the world need qualified managers and employees, i.e. trained human resources, to survive in an increasingly competitive environment.

Solnet (2007, pp. 130-131) states that service businesses are characterized by the intense communication that takes place between employees and customers. Interactions with employees within the service sector are the experiences that customers remember best. Employees who are uncomfortable dealing with customers or lack the training and expertise to meet customer expectations, cause customers to remember service experience as a bad experience.

2.2. Cognitive Load Theory

Cognitive load theory assumes that human cognitive architecture consists of two different types of memory; limited-capacity working memory and large-capacity long-term memory. Cognitive load theory argues that traditional education and training techniques overload students' working memory, thus ignoring the structure of human cognitive architecture. This theory seeks educational instructional designs to adapt to human cognitive architecture (Schnotz and Kürschner, 2007, pp. 472-475). The main subject of cognitive load theory is cognitive load. Every load put on the cognitive system while performing the learning activity is defined as the cognitive load (Sweller, Merrienboer, and Paas, 1998, p. 258). The theory has three different cognitive loads as a topic of discussion; extraneous, intrinsic and germane cognitive loads (Sweller, 2005, pp. 26-27).

- Extraneous cognitive load is due to inappropriate instructional designs that ignore the limits of working memory and fail to focus on the structure of working memory.
- Intrinsic cognitive load is the cognitive load that occurs due to the inherent complexity of information that needs to be processed. The element is determined by interaction levels.
- Germane cognitive load is the cognitive load that shows the effort expended to perform learning activities. It is the cognitive burden caused by effortless learning, but because this effortless learning can help build the cognitive scheme, it counts as an effective cognitive burden.

Table 1. Three Assumptions of the Cognitive Theory of Multimedia Learning (Mayer, 2009: 63)

Three Assumptions of the Cognitive Theory of Multimedia Learning	
Dual Channel	People have separate channels for processing audial and visual information.
Limited Capacity	The amount of information that people can process simultaneously on each channel is limited.
Active Processing	People participate in active learning by organizing the selected information into compatible mental representations and integrating mental representations with other information.

2.3. Multimedia

Multimedia learning is defined as learning through words and pictures. Multimedia is the simultaneous use of audial and visual data to achieve higher quality learning (Mayer, 2009, p. 5). According to Brooks, Nolan and Gallagher (2002, p. 13) multimedia is a single medium containing video, audio, text and images. Multimedia is the use of the elements such as Sound, Pictures, Animation, graphics and tables in a computer environment for a higher quality educational experience.

According to Mayer (2009, p. 63), multi-media learning is based on three basic assumptions; these are dual channel, limited capacity, and active processing assumptions. The three assumptions of the cognitive theory of multimedia learning are given in Table 1 above.

As shown in Figure 1, words and images used in multimedia presentation are detected and selected by the ears and eyes located in sensory memory. These words and images are then edited and integrated into the working memory, and then stored in long-term memory.

2.4. Augmented Reality

Augmented reality is a technology for displaying virtual objects created via computers on the real physical environment in real-time. As well as virtual reality (VR) technology where the user is in a fully virtual world, AR enables the user to perceive virtual objects and the real environment as a whole (Zhou, Duh and Billinghurst, 2008, p. 193). The concepts of virtual and augmented reality are two different technologies that are often confused. In order not to confuse these concepts, Milgram and Kishino (1994, p. 1322) had aimed to reveal the differences between these two concepts under the name of "reality-virtuality continuum".

Augmented reality is associated with virtual reality but not the same. While virtual reality creates an entirely artificial environment, augmented reality enriches the real environment with virtual objects (Höllerer and Feiner, 2004, p. 221). Augmented reality is being used by many different sectors for various purposes.

Juan and Perez (2011, p. 449) have used augmented reality technology as a supporting application in the treatment of fears of acrophobia patients. They point out that augmented reality technology could also be used in psychological treatments.

Peddie (2017, p. 89) notes that augmented reality technology, which uses 3-D modelling, offers enormous opportunities for professional groups such as architecture and engineering.

Kourouthanassis et al., (2015, p. 80), in their study, used augmented reality technology as a virtual guide for tourists in the promotion of the island of "Corfu" located in Greece. At the end of the study, they received positive feedback from tourists about augmented reality technology.

The use of augmented reality in education also produces positive results. The examples of these results could be given as developing the ability to think in 3D (Ibili and Şahin, 2013, p. 7), increasing interest in the lesson and focusing on the subject (Yusoff and Dahlan, 2013, p. 256), increasing sensory-motor development (Fleck and Simon, 2013, p. 20) and reducing cognitive load (Küçük, Yılmaz and
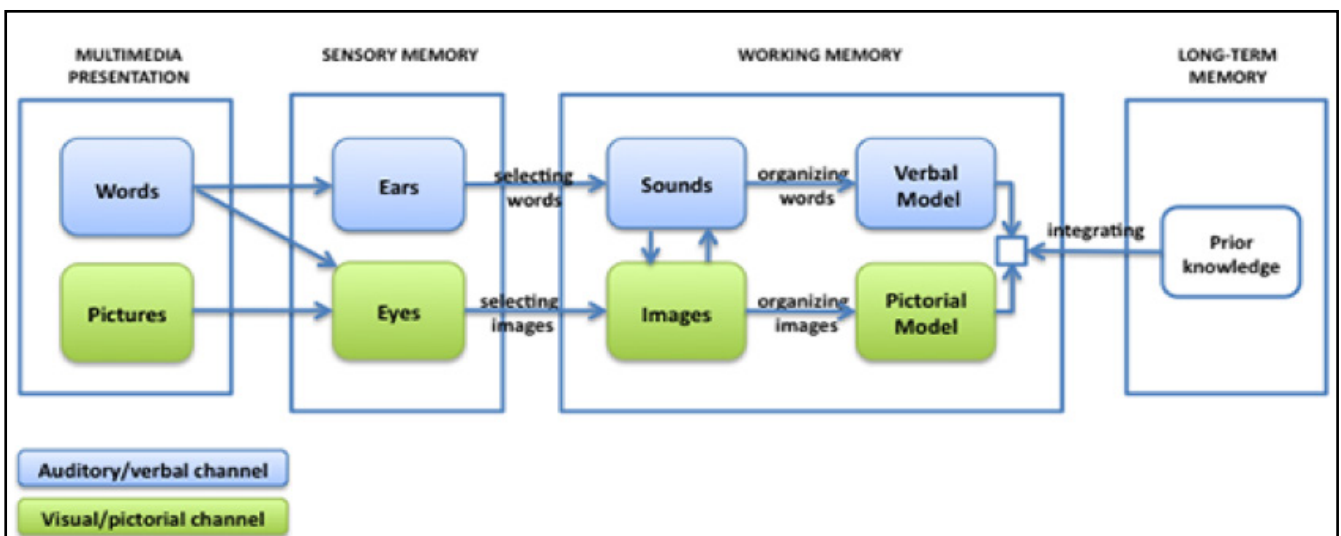
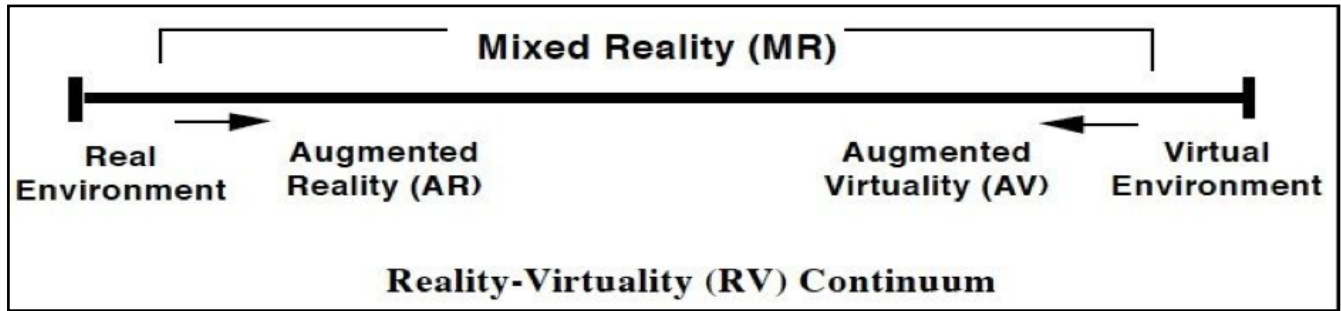**Figure 1.** Cognitive Theory of Multimedia Learning (Mayer, 2009, p. 61)

Figure 2. Reality-virtuality continuum (Milgram and Kishino, 1994: 1322)

Göktaş, 2014, p. 401). There are augmented reality applications that can also be used within higher education. It helps students understand concepts better (Peddie, 2017, p. 96).

3. Method

In the method part of the research, one-to-one interviews were conducted with 15 academicians working in the tourism faculties of Anadolu University and Eskişehir Osmangazi University using a semi-structured interview form. The interview form was taken from the study of Küçük et al. (2014) and adapted for using in the field of tourism education by the researcher. According to Türnüklü (2000), the semi-structured interview technique is one of the data collection techniques suitable for use in educational sciences. This technique can also provide the researcher with some advantages such as asking side questions and getting more in-depth answers from the participants, depending on the flow of the interview. The case study pattern from qualitative research methods was used in the study. According to Yıldırım and Şimşek (2011), in case studies, a new case is explored as a whole. The details of the interview are given in Table 2 below.

Tourism academicians interviewed within the scope of the research were asked 8 questions. All interviews were conducted in the academician's rooms. The interviews were recorded on the researcher's smartphone with the permission of the academics and then transcribed by the researcher for content analysis. The findings were interpreted by the researcher under 4 themes such as strengths, weaknesses, threats and opportunities.

4. Findings and Discussions

In this part of the study, the responses of 15 tourism academics to 8 interview questions about the use of mobile augmented reality applications (MAG) in tourism education were gathered under the themes of Strengths, Weaknesses, Opportunities and Threats. Table 3 shows the strengths. The views of some academicians are as follows.

> P6: "I believe in the importance of making it concrete. Therefore, I think undergraduate and graduate students can learn abstract concepts very easily with this technology."

Tourism education is mainly a field of abstract courses. Embodying the course concepts will make it easier for students to better understand and store the subject, as stated in interviewer 6.

Table 2. Information about the interview

Participant	University	Title	Department	Duration	Date
P1	Anadolu University	Assoc. Prof. Dr.	Tourism Management	07:25	31.07.2019
P2	Anadolu University	Prelector	Tour Guiding	07:32	1.08.2019
P3	Anadolu University	Research Asst.	Tourism Management	06:42	1.08.2019
P4	Osmangazi University	Assoc. Prof. Dr.	Tour Guiding	07:01	1.08.2019
P5	Osmangazi University	Assoc. Prof. Dr.	Gastronomy & Culinary Arts	11:33	6.08.2019
P6	Osmangazi University	Research Asst.	Tour Guiding	08:24	6.08.2019
P7	Anadolu University	Asst. Prof. Dr.	Tour Guiding	09:53	6.08.2019
P8	Anadolu University	Preplector	Tourism Management	08:32	6.08.2019
P9	Anadolu University	Assoc. Prof. Dr.	Tour Guiding	07:32	6.08.2019
P10	Osmangazi University	Prof. Dr.	Gastronomy & Culinary Arts	12:27	6.08.2019
P11	Anadolu University	Assoc. Prof. Dr.	Gastronomy & Culinary Arts	07:27	2.09.2019
P12	Anadolu University	Assoc. Prof. Dr.	Tourism Management	08:06	2.09.2019
P13	Osmangazi University	Assoc. Prof. Dr.	Tourism Management	09:43	2.09.2019
P14	Osmangazi University	Prelector	Gastronomy & Culinary Arts	08:35	2.09.2019
P15	Osmangazi University	Asst. Prof. Dr.	Gastronomy & Culinary Arts	06:58	2.09.2019

Table 3. Strengths

Strengths	Frequency
Embodying the subject of the course	12
Strengthening the understanding of the subject	10
A real educational experience	9
Improving student satisfaction	7
Addressing more sense organs	5
Include students more in the course	4
Transmission of information through correct sources and channels	2

P3: "It will simplify the students learning process. In other words, it will enable them to understand a topic more simply, which makes it easier to understand visually. When animations are into the work, I think it will make it easier to learn the subject."

The use of audio and visual information together is an element that facilitates learning and improves the quality of information. In this context, mobile augmented reality applications have great opportunities for students. As interviewer 3 points out, especially animations will improve students' learning.

P14: "It will facilitate the student's learning effort and shorten the learning duration. An application that can be used anywhere at any time, can help learn more efficiently in a shorter time. Students will work with pleasure. Unfortunately, students don't even read the books we give, they just memorize powerpoint presentations, but this technology will help them learn instead of memorizing."

Today, many students prefer to memorize the information rather than learn it to get higher scores from the exams. But apps like mobile augmented reality can give students a real educational experience.

P2: "I would be happy to use it in class. I think it would make the lesson much more interactive. Who are we giving the course for, students, in a very general sense, our customers, this will increase students' satisfaction. Generation Z, in particular, is far ahead of us in technological terms, so augmented reality will meet their expectations and needs at a higher level. Their satisfaction will make me happy also. Beyond satisfaction, it will increase the students' level of achievement, and this will also give me satisfaction, so it would be good to use this technology."

Table 4. Weaknessess

Weaknessess	Frequency
Shortages of use in the tourism management department	5
Educators' lack of education for technology	4
Infrastructure and hardware deficiencies	3
Risk of rapid deterioration	3
Sustainability	2

It is of great importance that the courses given in tourism education are delivered to the students in the right way and through the right channels. Today's students are very interested and knowledgeable about technology. In this sense, as interviewer 2 points out, technology-assisted education can achieve extremely beautiful results.

P8: "Definitely I think. The tourism sector is an applied sector, there is no point in given education in a very conceptual way. Since the past, we have been trying to design tourism education as much as possible to appeal to more sense organs, so we have internships and so we have practical courses. Tourism geography, tour planning will be very useful in courses such as."

Tourism refers to service and service refers to application. In this sense, it is just as important to be able to see and experience the knowledge in practice as acquiring conceptual knowledge in courses.

P10: "It would have a positive effect because we will be integrating students into the lesson. For example, with augmented reality, students will be able to learn as if they were there. This, of course, Tourism 4.0 or Industry 4.0' also mentioned in smart tourism can enter into the topic. I think it may be useful in the introduction of destinations as the subject of the course."

The experience of a subject or region can make a big difference in the learning process. Mobile augmented reality offers students the opportunity to experience it as a simulation.

P4: "I'd be happy to use this technology. I think it would be more accurate to teach the lessons in the newest way and to teach them according to Generation Z. Giving information through the right sources and the right channels is very important for the recipient, so I think augmented reality should be used in the lessons."

The efficiency of new technologies to be used in education is related to the attitude of academics towards technology. As interviewer 4 points out, all academics interviewed intend to use mobile augmented reality in lessons. The following Table 4 contains the findings on the weaknesses of mobile augmented reality technology, obtained from interviews with academics.

Table 5. Oppurtunities

Oppurtunities	Frequency
Catching world standards in education	7
More permanent and higher quality information storage in long-term memory	5
Day-long training opportunity	3
Makes lessons interactive	3
Simultaneous advancement of industry and education	2

P11: "Perhaps not for the Department of Tourism Management, but I think it should be used extensively in the Departments of Guidance and Gastronomy. Because tourism management is a little more theoretical than other departments. But it will be useful when used in practical areas."

Gastronomy and guidance education, which is included in tourism education, are more suitable for visualization than the department of business administration. The main reason for this is that the courses in business education consist of more theoretical subjects.

P15: "I consider myself sufficient in terms of using technology, but this is a new technology. I need to get an education about technology in order to be able to master the level that I need in my lectures. On the other hand, the classrooms and the amps in the faculties need to be updated accordingly for the use of this technology in my lectures."

The basic conditions for maximum efficiency from mobile augmented reality technology are that the person providing the training has knowledge about the technology and that the environment in which the training is given is adapted to the use of the technology.

P13 "It may not be technology, but there may be a risk of sudden deterioration of the technical equipment needed to be able to use this technology. This situation can be a problem for academics and students at an unexpected moment."

The greater the technological equipment used is, the riskier the technology is in terms of equipment disruption or system disruption. In this sense, precautions should be taken for any untimely disruptions.

P7: "As a disadvantage, will it be sustainable? This technology can be very smart, but could it be something that would break down quickly? The system may not always work. When technology comes into play, there's always a risk."

Technology is a concept that develops every day. Mobile augmented reality technology is the technology that has the most opportunities for education in today's conditions. In this sense, as

technology develops, education has to adapt to this development. Table 5 lists the opportunities that academics have indicated for the use of mobile augmented reality applications in tourism education. Some opinions are as follows.

P3: "The potential to increase academic achievement is high. As a result, countries in the world develop their education with such technologies, such technologies should be used in tourism education in order not to be left behind."

As always in the tourism sector, today's competition rate is also very high. To gain a competitive advantage in the field of tourism, it is necessary not to stay behind competitors and even be in front of them if possible. Using mobile augmented reality in education can help the tourism sector gain a competitive advantage in its future.

P13: "Of course, if you can use such applications correctly, if the other party is also satisfied with it, the knowledge in long-term memory will improve in its quality and more permanent place, so students' success will increase."

The quality of storage of information in long-term memory will have a direct effect on the yield that will be obtained from the use of information in the future.

P4 "First of all, it will provide day-long learning as it will not compress the learning process into a specific place or time. Students will be able to study at whatever time the learning hour is most appropriate for them. It will make the learning process continuous. The way they learn will change with technological approaches."

The time and space to achieve maximum performance for learning may vary from student to student. Mobile augmented reality can help personalize education by allowing students to learn when they feel most ready and wherever they want.

P1 "Lessons in all areas, should to be somewhat interactive. Although tourism is service-oriented and based on human relations, the use of technological applications is also necessary within tourism. On the one hand, another characteristic of tourism is that instead of product flow in tourism, the flow of information is intense. Information flow is provided by information

Table 6. Threats

Threats	Frequency
Encouraging the student to choose the easy path	4
Fully digitising tourism	2
Reducing reading habits	1

systems. So this means that tourism students should make more use of information technologies. But on the one hand, that means that schools and their teachers also have to keep up with it."

Making the courses interactive has a huge impact on the quality of the knowledge that students will gain. The participation of students in the learning process can help students not forget the information.

P15: "As with any education, tourism education should be supported with this and such technologies. The changing world affects every area, tourism cannot stay out of it. As such technologies become physical evidence, the tourism sector is affected by this situation, therefore the education area of tourism should also be affected. If this kind of technological applications will not be used in tourism education, the technology should not be used in the tourism sector. But these technologies are in the industry as physical evidence."

In the tourism sector, technological equipment and applications are used extensively and the number is increasing every day. In this context, the use of technology in courses is important for students not to fall behind the sector. Table 6 shows the threats mentioned by tourism academics. Some are as follows.

P3: "I think there are pros and cons of this work in terms of the effort spent for a learning experience. Learning can increase when students strive for certain things, this technology can always offer students the simplest way. There's a Russian writer saying, "if you're trying to understand something by writing, you're reading it 3 times." You reading with your eyes firstly, secondly you are reading with your brain to understand and finally you are reading while you are writing. Visual training is very useful, but some subjects can't be worked out just by watching."

Mobile augmented reality offers students a very easy way to learn. As interviewer 3 points out, this could distract students from doing research. At this point, areas where technology will be integrated into the courses and the rate of integration should be determined well.

P10: "I think it should be supported, I think it would be positive, but there is a limit to that. Because tourism is about travelling and seeing, providing an experience. Tourism is an abstract concept because it's in the service sector, but such applications, like this, embody it a little bit. For example, if someone who has never

seen Cappadocia experiences it with augmented reality and it only affects their awareness of the destination, it is very good. Contrary to the concept of tourism, if it completely assimilates the destination, augmented reality is not good, making tourism completely digital is not a good thing."

On the basis of tourism, it is about traveling, seeing and experiencing. Mobile augmented reality usage rate should not replace tourism, rather should be considered as a supporting element of Tourism.

P12: "It can reduce reading but it increases the acquisition of audio and visual information. But this is where the instructor has to step in. A bridge between reading and visual and auditory knowledge can be established by taking exams with the classical method."

Reading is a habit that must be acquired for everyone from every field. When integrating mobile augmented reality applications into the courses, attention should be paid to not causing a negativity influence on the reading habit.

5. Conclusion and Recommendation

In order to increase the quality of tourism education, it is an undeniable fact that tourism education needs to be kept up to date and supported by the technologies of the age. In this context, in order to increase the efficiency of tourism education, education needs to be supported by new technological applications such as mobile augmented reality (MAR).

Tourism academics who joined the research as a participant found mobile augmented reality applications useful and emphasized that they should be used in tourism education. According to the academics, the strengths of mobile augmented reality applications are that they embody the covered subject, strengthen the understanding of the subject, provide a real educational experience, appeal to more sense organs, and improve the educational experience of the students (Table 3).

The weaknesses that tourism academics have mentioned for the use of mobile augmented reality applications in tourism education are as follows; narrow usage area especially for tourism management department, academics' lack of knowledge about augmented reality, infrastructure and hardware deficiencies, risk of rapid deterioration and sustainability. These weaknesses expressed by tourism academics also emerge as shortcomings that need to be addressed in order to achieve maximum benefit from mobile augmented reality applications (Table 4).

In the event of elimination of the stated weaknesses, the use of mobile augmented reality in tourism education offers opportunities such as meeting world standards in education, storing better quality information, day-long training, interactive lessons and co-operation of educating and sector (Table 5).

Encouraging students to choose the easy way, digitising tourism completely and reducing reading habits are the threats that academicians have expressed about the use of mobile augmented reality applications. Tourism academics play a major role in protection against these threats. The extent to which mobile augmented reality applications should be included in the lesson should be planned by the academician and acted within the framework of this plan (Table 6)

When the relevant literature was reviewed, no studies on the use of augmented reality technology in tourism education were found. The mobile augmented reality technology, which has great opportunities for education, should also be used in tourism education. Tourism education is extremely critical to the quality and future of the sector due to its impact on the quality of human resources in the sector. In this sense, the development of the sector is through the development of education and the development of education is through the development of modern technologies in education.

Tourism academics have stated that they are satisfied with mobile augmented reality applications, that this technology has great opportunities to improve tourism education, and that the use of mobile augmented reality in the education of Generation Z will produce positive results. It should not be forgotten that the success rate achieved as a result of a new application or the use of new technology in education is directly proportional to the educators' perspective on the new application or technology and their intention to use it.

It is thought that tourism education needs to be supported by mobile augmented reality technologies in order to increase its effectiveness. It is important to study on the subject to keep the subject up to date, to raise awareness and to start using mobile augmented reality applications in tourism education.

6. Research Limitations

This research is limited only to 15 Tourism academicians working in the tourism faculties of two foundation universities in Eskişehir. These limitations have been put in place because trying to reach all tourism academics will take a lot of time and expenses. Research data was collected by a semi-structured interview technique. Research data were collected in July, August, and September 2019. The research is not intended for any generalization.

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