

# The Relationship and Interactions Among Digital Literacy, Innovativeness and Entrepreneurial Inclinations: A Study on University Students

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## ABSTRACT

**Purpose:** The purpose of the study is to determine the relationships among digital literacy, innovativeness and entrepreneurial tendencies of tourism students and to examine the effects of digital literacy and innovativeness tendencies on entrepreneurial tendencies.

**Methodology:** In the study, survey technique was used to collect primary data. Through convenience sampling technique, 399 questionnaires were obtained. The research data were analyzed using Smart PLS.

**Findings:** According to the findings of partial least squares based structural equation modeling (PLS-SEM), it was determined that digital literacy tendencies of tourism students have a positive effect on both innovativeness and entrepreneurship tendencies, and innovativeness tendencies have a positive effect on entrepreneurship tendencies. In addition, it has been observed that innovativeness has both a mediating and a positive effect on the effect of tourism students' digital literacy tendencies on their entrepreneurial tendencies.

**Practical Implications:** The result of this study supports the importance of specialization on digital literacy and innovativeness. Both entrepreneurship and digitisation courses should be compulsory in tourism departments and other departments with links to the sector.

**Originality:** The difference of the study from other studies is that the innovativeness variable is used together with digital literacy and entrepreneurship variables because these variables have not been used together before. This gap in the literature is tried to be filled with the findings of the study.

**Keywords:** Tourism education, digital literacy, innovativeness, entrepreneurship

**Jel Codes:** E21, L83

# Dijital Okuryazarlık, Yenilikçilik ve Girişimcilik Eğilimleri Arasındaki İlişki ve Etkileşimler: Üniversitesi Öğrencileri Üzerine Bir Araştırma

## ÖZ

**Amaç:** Araştırmanın amacı, turizm öğrencilerinin dijital okuryazarlık, yenilikçilik ve girişimcilik eğilimleri arasındaki ilişkileri belirlemek ve dijital okuryazarlık ve yenilikçilik eğilimlerinin girişimcilik eğilimleri üzerindeki etkilerini incelemektir.

**Yöntem:** Çalışmada birincil veri toplamak için anket tekniği kullanılmıştır. Kolayda örnekleme tekniği ile 399 anket elde edilmiştir. Araştırma verileri Smart PLS kullanılarak analiz edilmiştir.

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**Bulgular:** Kısmi en küçük kareler tabanlı yapısal eşitlik modellemesi (PLS-SEM) bulgularına göre, turizm öğrencilerinin dijital okuryazarlık eğilimlerinin hem yenilikçilik hem de girişimcilik eğilimleri üzerinde pozitif bir etkiye sahip olduğu, yenilikçilik eğilimlerinin ise girişimcilik eğilimleri üzerinde pozitif bir etkiye sahip olduğu tespit edilmiştir. Ayrıca turizm öğrencilerinin dijital okuryazarlık eğilimlerinin girişimcilik eğilimleri üzerindeki etkisinde yenilikçiliğin hem aracı hem de pozitif etkiye sahip olduğu görülmüştür.

**Sonuç ve Öneriler:** Bu çalışmanın sonucu, dijital okuryazarlık ve yenilikçilik konusunda uzmanlaşmanın önemini desteklemektedir. Turizm bölümlerinde ve sektörel bağlantısı olan diğer bölümlerde hem girişimcilik hem de dijitalleşme dersleri zorunlu olmalıdır.

**Özgün Değer:** Çalışmanın diğer çalışmalardan farkı yenilikçilik değişkeninin dijital okuryazarlık ve girişimcilik değişkenleri ile birlikte kullanılmasıdır çünkü bu değişkenler daha önce bir arada kullanılmamıştır. Literatürdeki bu boşluk çalışmanın bulguları ile doldurulmaya çalışılmıştır.

**Anahtar Kelimeler:** Turizm eğitimi, dijital okuryazarlık, yenilikçilik, girişimcilik

**Jel Sınıflandırması:** E21, L83

## Introduction

Today, the intensive use of technology has increased the need for digitalization. As the reliance on digital technology is increasing day by day, it is necessary to pay close attention to how individuals use this technology and the skills they possess. The increase in digitalization necessitates digital literacy, innovativeness and entrepreneurship skills. The skills are becoming a strong requirement for the sustainability of businesses and the growth of national economies. Therefore, educational institutions play a facilitating role in providing tourism students with digital skills suitable for the future workforce through entrepreneurial and innovative ways of learning with a focus on digital literacy (Reddy et al., 2023; Lankshear & Knobel, 2015).

The term digital literacy in the study is defined as an individual's access to the current digital information economy. The term innovativeness is defined as the inter-individual differences that characterize people's reactions to new things. Entrepreneurship is defined in the literature as an individual's ability to transform ideas into viable new ventures. Digital literacy, innovativeness and entrepreneurship are recognized as driving forces in the growth and development of the tourism sector. With digitalization, the skills expected from tourism employees in today's conditions can be listed as collaboration, communication, problem solving, critical thinking, creativity, productivity, innovation, entrepreneurship and digital literacy (Chiao et al., 2018; Laar et al., 2017; Lilian, 2022; Goldsmith and Foxall, 2003; Adeel et al., 2023).

The review of the extensive literature found that there are very few studies on digital literacy and innovativeness (Kurt Demircan & Katisöz, 2022; Zeynalov, 2022; Yazıcı Yılmaz & Avcı, 2022; Dominguez et al., 2021; Chiao et al, 2018), in-

dividual innovativeness perceptions are generally measured on tourism students (Abduzada, 2022; Zeynalov, 2022; Işık & Türkmendağ, 2016; Meriç et al., 2019) and studies generally focus on entrepreneurship education (Adeel et al., 2023; Soliman, 2011; Oral, 2020). In these studies, the mediating role of innovativeness in the effect of digital literacy on entrepreneurship has not been investigated. In order to address this research gap, the mediating role of innovativeness in the effect of digital literacy on entrepreneurship was examined. In addition, it has been revealed that the number of studies on the effect of digital literacy on entrepreneurship tendency is limited. The fact that there is no study in the literature in which the concepts of digital literacy, entrepreneurship and innovation are examined together and that these concepts are thought to mutually affect each other makes this study different.

The aim of the study is to fill this gap in the literature by examining the interactions and relationships between tourism students' digital literacy, innovation and entrepreneurial tendencies. What are the current digital literacy, entrepreneurship and innovativeness tendencies of tourism students? Is there a relationship between digital literacy and innovativeness? Are there any effects of digital literacy and innovativeness tendencies on entrepreneurship tendencies? The questions reveal the problem statements of the study. Thus, it is thought that updates can be made to increase these skills in the education curriculum of tourism students. Because it is thought that there are significant deficiencies in the curriculum, especially regarding innovativeness and entrepreneurship. This idea is supported by Wei et al. (2024). Wei et al. argue that current innovativeness and entrepreneurship education for university students still faces a number of problems and challenges.

The study contributes to the determination of digital literacy, innovativeness and entrepreneurship tendencies of tourism students and to reveal the relationships among these variables. A study in which the three variables are used together is not found in the literature. Using the three variables together constitutes the core value of the study. Since the relationships among the variables are determined in the model tested in the study, the requirements that tourism students will need in order to achieve these tendencies will be revealed. In this direction, the study guides future studies by determining the tendencies of tourism students. In addition, the fact that the study is the first in terms of the subject it deals with shows that it can be a guide for future studies. Finally,

with the findings of the study, it is aimed to contribute to the development of the activities that stakeholders involved in the education of tourism students are responsible for.

## **Literature Review**

### **Digital Literacy in Tourism**

The concept of digital literacy was first used in 1997 in Paul Glistler's book "Digital Literacy". According to Glistler, digital literacy is defined as the ability to understand and use information in multiple formats from a wide variety of sources when presented through computers and the Internet (Lankshear & Knobel, 2015). According to Ng (2012), it is defined as the awareness, attitude and ability of individuals to use digital tools and facilities appropriately to identify, access, manage, integrate, evaluate, analysis and synthesize digital resources, create new knowledge, create media expressions and communicate with others. According to another definition, digital literacy is the sum of the abilities required for an individual to access, navigate, understand and contribute to the existing digital information economy (Lilian, 2022). The concept of digital literacy has become central for students as hybrid learning has become the new norm post-pandemic and due to the earthquake disasters in Turkiye on February 6, 2023, which had far-reaching effects. The distance education approach provides easy access and convenience to learning opportunities. For this reason, List (2019) defined digital literacy as the ability to gain an understanding of computer and internet resources (Purnama et al., 2021).

The dimensions of digital literacy are categorized three main headings: technical, cognitive and social-emotional. The technical dimension involves solving problems from a more technological perspective. The cognitive dimension integrates high-level competencies such as problem solving, management of complexity or complex environments, development of logical reasoning, cognitive analysis processes, comparison, inference, interpretation, evaluation, creativity and production. The social-emotional dimension involves the management of one's own behaviours and emotions and establishing healthy relationships with them. Therefore, it includes skills that express the ability to read and manage one's own and others' emotions, motivations and behaviours during social interaction. It is possible for individuals who will take part in the tourism indus-

try to have these skills by having technological innovation thinking (Ng, 2012; Martínez-Bravo et al., 2022).

Technological innovation in the tourism industry serves as a tool to meet the growing need for remarkable tourist experiences. In today's tourism innovation, personalization is a decisive element that contributes to the tourist's ability to design and produce a tourism product (such as excursions or holiday packages) according to his or her taste and preference. However, advances in technology require tourism industry employees to be more qualified. These employees are expected to use and apply technological knowledge effectively. The skills expected from tourism employees in today's conditions can be listed as collaboration, communication, problem solving, critical thinking, creativity, productivity and most importantly digital literacy (Chiao et al., 2018; Laar et al., 2017).

It is important to note that digital technologies that support connectivity and correspondence between tourism stakeholders are important for institutional success. Therefore, universities and especially academics should be ready to successfully adapt digital tools into the curriculum to help promote student engagement with the course (Dexeus, 2019). In this context, universities providing tourism education offer "Tourism Information Technologies", "Front Office, Housekeeping and Food and Beverage Automation", "Computerized Front Office Management", "E-Entrepreneurship in Tourism", "Digital Tourism", "Innovative Tourism Applications", "Ticket Sales", "Tour Operation Applications", "Simulation Applications in Hotel Businesses", "Online Tourism Applications" courses for the development of digital literacy skills of tourism students (Zeynalov, 2022: 16-17).

Based on the previous literature, little attention has been paid to digital literacy tendencies of students. There are almost no studies on tourism students in which digital literacy tendencies are measured. In particular, it is seen that the digital literacy levels of university students are measured rather than tourism students. In the study by Dominguez et al. (2021), digital literacy and ICT (information and communication technology) use were examined in the field of tourism and as a result, the lack of specialization in digital literacy in the field of tourism was emphasized. In Zeynalov's (2022) study on open education tourism students, it was stated that digital literacy skills have a direct and positive effect on digital entrepreneurship tendencies. Kurt Demircan and Katsöz (2022) conducted a study on associate degree students and found that the existing digital

tools owned by the associate degree department showed a significant difference on the level of digital literacy. Dalgıç et al. (2024) found that digital literacy has a mediating role in the learning outcomes of tourism faculty students. The review of literature other than tourism students were found that Long et al. (2023) revealed that there is a gender difference in digital literacy and it was determined that men have more digital literate tendencies than women. In their study on accounting students, İmjai et al. (2024) observed that digital literacy significantly positively affects internship performance and that students with high competence in these areas are better able to apply their skills in real-world professional settings and demonstrate continuous learning. Erdat et al. (2023) reported that the digital literacy level of nursing students is above average and that technical, cognitive and socio-emotional factors affect digital literacy. In another study on nursing students by Lokmic-Tomkins et al. (2022), it was found that nursing students need to receive basic digital literacy training before starting to work in a clinic, and it was emphasized that these should be supported throughout the program to ensure an effective transition to nursing practice in digitally evolving healthcare environments.

### **Innovativeness in Tourism**

The term innovation is defined in close connection with terms such as invention. Inventions are important scientific and technological developments that occur without any industrial use in mind. Innovations, on the other hand, are the institutionalization of production methods or the further development of the invention for industrial use with the introduction of new products to the market (Hjalager, 1997). For tourism businesses, innovation is defined as the production of new and useful goods and services in order to survive, grow and gain competitive advantage (Aarstad et al., 2015). Thus, innovation represents the tendency to pursue creative and new solutions to the challenges faced by a tourism business (Randolph et al., 2022). When it is defined in terms of individuals, the concept of innovativeness refers to interindividual differences that characterize people's reactions to new things (Goldsmith and Foxall, 2003).

The dimensions of innovation can be listed as creativity, openness to new ideas, willingness to innovate, willingness to take risks, and willingness to share ideas and information (Hajiyeva, 2018). Innovations in the tourism industry can take the form of goods/services, processes, managerial, marketing or organiza-

tional innovations. There are three critical determinants of innovative capability in tourism. The first is knowledge, which allows innovations to be generated and technologies to be learned from the market and competitors, the second is a set of organizational requirements for innovation, and the third is the human factor, which includes variables related to management style, staff training and organizational culture. Tourism is one of the most important industries for government policy making. It is therefore a strong driver of innovation. Information and communication technology (ICT)-based innovation can only have a sustainable competitive impact if it is integrated with a knowledge creation strategy that focuses on the accumulation of knowledge on tourists, destinations and service providers (Hall and Williams, 2009; Stamboulis and Skayannis, 2003; Kallmuenzer and Peters, 2018; Martinez-Roman et al., 2015).

In this context, as a result of the trainings given to tourism students by universities providing tourism education, the awareness levels of these students are important in terms of innovative perspective. The review of the literature show that individual innovativeness perceptions are generally measured on tourism students. In the study conducted by Işık and Türkmenbaş (2016) on tourism students (500 participant), a significant difference was found between the department of study and the dimensions of resistance to change and opinion leadership. In a study conducted by Meriç, Bozkurt, and Işık (2019) on tourism management students (160 participant), it was determined that tourism students were inclined to innovativeness, but there was no difference in terms of demographic characteristics. The review of literature other than tourism students were found that Ataei et al. (2024) revealed that innovation culture has a mediating role in the entrepreneurial leadership tendencies of agricultural students. In addition, the effect of innovation culture and entrepreneurial orientation on the recognition of entrepreneurial opportunities was found to be positive and significant. It was concluded that entrepreneurial leadership in universities can influence students' entrepreneurial orientation and innovation culture and lead them to explore entrepreneurial opportunities. Manzi-Puertas et al. (2024), in their study on university students, contributes to understanding the different stages of entrepreneurship and the need for entrepreneurs to develop innovative behaviour throughout the entrepreneurial process. In their study on nursing students, Atasoy et al. (2023) reported that individual innovativeness has an impact on the development of existing innovative skills of the students. Nguyen

and Nguyen's (2024) study on business school students revealed that individual innovativeness has a positive and significant effect on digital entrepreneurship.

### **Entrepreneurship in Tourism**

Entrepreneurship is generally defined as an individual's ability to transform ideas into viable new ventures. Therefore, entrepreneurship is recognized as a key driver of tourism economic growth (Adeel et al., 2023). According to Antoncic and Hisrich (2004), entrepreneurship is a concept that refers not only to the creation of new business ventures but also to other innovative activities such as the development of new goods and services, technologies, administrative techniques, strategies and competitive postures. This concept includes the sub-dimensions of new business venture, goods or service innovation, process innovation, self-renewal, risk taking, proactiveness and competitive aggressiveness (Antoncic and Hisrich, 2004).

Entrepreneurship is considered to be the key to the financial performance of tourism businesses and is referred to as the spirit of entrepreneurial behaviour. The tourism industry is driven by entrepreneurs with vision, innovation and creativity (Kallmuenzer et al., 2019). The tourism sector in Turkiye has developed thanks to various policies, especially in 1980 and afterwards. In 1982, the "Tourism Incentive Law" numbered 2634 was adopted to identify tourism regions, areas and centers in Turkiye and to develop opportunities for potential entrepreneurs to develop tourism in these areas (Dalgın et al., 2015: 174).

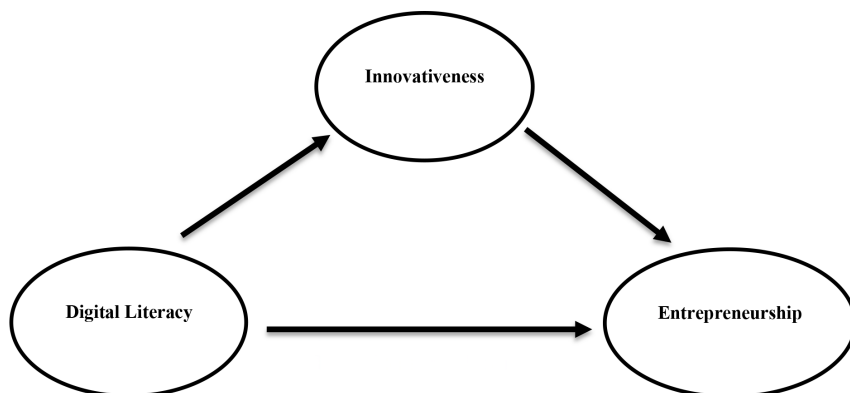
When entrepreneurship is considered from the perspective of tourism students, the perspective that universities providing tourism education give to these students is important. With this perspective, the number of successful entrepreneurs increases. In order to increase entrepreneurship tendencies in universities, courses in this field are increased. With these trainings, not only the entrepreneurial tendencies of tourism students, but also their innovation and digital literacy tendencies increase (Zeynalov, 2022).

Previous literature indicated that lack of capital and experience are the most important barriers to tourism entrepreneurship in Mureithi's (2010) study on tourism and hotel management students in South Africa. Encouraging more young entrepreneurs to enter the sector through special support for tourism students and entrepreneurship training in tourism was emphasized. Soliman's



(2011) study on tourism undergraduate students in Egypt revealed that students have the intention to start their own business after graduation. However, the lack of entrepreneurship education was emphasized as another important finding. In another study, Bozkurt and Erdurur (2013) conducted research on tourism and hotel management undergraduate students and found that there is a significant positive relationship between entrepreneurial personality traits and entrepreneurial tendencies. Horng et al. (2021), in a study on tourism students, an innovative entrepreneurship model was created and added to the curriculum. It was observed that the innovation and entrepreneurial tendencies of tourism students who received education with this curriculum for one semester increased significantly. The review of literature other than tourism students were found that Nguyen et al. (2024), in their study on university students, stated that blockchain and artificial intelligence literacy directly affect digital entrepreneurship intention. Lee et al. (2019), in their study on university entrepreneurship club students, emphasized that entrepreneurship has a significant effect on sub-factors such as innovativeness, risk-taking and proactiveness. In addition, as a result of the analysis of the mediating effect of entrepreneurship on innovative behaviour, it was revealed that all sub-factors (innovativeness, risk-taking and proactiveness) partially mediated. The study by Fan et al. (2024) strengthens the positive relationship between entrepreneurship education and university students' tendency towards innovativeness. Shabbir and Pallares-Venegas (2024) draw attention to the need for entrepreneurship education. This need is supported by Oulhou and Ibourk's (2023) study on university students. According to them, the quality of entrepreneurship education significantly influences the development of entrepreneurial propensity among students. Finally, Zhou and Zhou (2022) and Boubker et al. (2021) argue that enhancing university students' innovativeness and entrepreneurial propensity can be achieved by strengthening the curriculum through the inclusion of new educational modules.

Based on the previous literature, conceptual the model and hypotheses of the study are shown in Figure 1 below.



**Figure 1. Research Model**

**H<sub>1</sub>:** Digital literacy has an effect on innovativeness.

**H<sub>2</sub>:** Innovativeness has an effect on entrepreneurship.

**H<sub>3</sub>:** Digital literacy has an effect on entrepreneurship.

**H<sub>4</sub>:** There is a mediating role of innovativeness in the effect of digital literacy on entrepreneurship.

In this context, it is assumed that digital literacy tendencies of tourism students have an impact on their innovation and entrepreneurship tendencies, and innovativeness tendencies have an impact on their entrepreneurship tendencies. In addition, it is assumed that innovative attitudes and behaviours have an effect on the effect of tourism students' digital literacy tendencies on their entrepreneurial tendencies.

## **Methodology**

The aim of the research is to determine the relationships between digital literacy and innovativeness tendencies of tourism students and to examine the effects of digital literacy and innovativeness tendencies on entrepreneurship tendency. In order to achieve the aim, a questionnaire was applied to students studying tourism. The questionnaire used in the research consists of 4 sections.

There are a total of 46 questions and statements in four sections. The items in the scale are graded according to a 5-point Likert-type scale (1-Strongly Disagree, 2-Disagree, 3-Neither Agree nor Disagree, 4-Agree, 5-Strongly Agree).

In the first part of the questionnaire, 5 questions were asked to determine the demographic characteristics of the undergraduate students participating in the study. In the second part of the questionnaire, the “Digital Literacy Scale” created by Ng in 2012 and consisting of 10 statements was used. The scale was adapted into Turkish by Üstündağ, Güneş, and Bahçivan (2017). In the third part of the questionnaire, the “Innovativeness Practices Scale” consisting of 10 statements created by Bayındır and Demir in 2019 was used. In the fourth part of the questionnaire, the “Scale for Determining Entrepreneurial Tendency” consisting of 21 statements created by Çuhadar and Altinel in 2016 was used.

The population of the study consists of university students. The sample consists of tourism undergraduate students. According to the information obtained from Nevşehir Hacı Bektaş Veli University Faculty of Tourism Student Affairs Unit, the total number of tourism management, gastronomy and guidance undergraduate students, including regular and second education, was determined as 1029. Accordingly, it can be said that the sample size of 246 is considered sufficient for the study (Yazıcıoğlu and Erdoğan, 2014).

In order to reach this number, 500 questionnaires were distributed and 412 questionnaires were collected. 13 questionnaires were removed because they were not suitable for analysis. A total of 399 questionnaires suitable for analysis were obtained.

Partial least squares structural equation modelling (PLS-SEM) was applied to the obtained data and the findings are presented below. Partial least squares structural equation modelling (PLS-SEM), also known as composite-based structural equation modelling, has become a popular method for estimating (component-based) latent variables and their relationships and path models. The method is an iterative algorithm that solves the blocks of the measurement model separately and then estimates the path coefficients in the structural model in a second step. Thus, PLS-SEM is expressed as a smoother model that best explains the variance of latent and manifest (observable) variables compared to other statistical analyses (Vinzi et al., 2010; Sarstedt et al., 2021; Hair and Alamer, 2022).

## Results And Discussion

In this section of the study, firstly, the findings regarding the demographic information of the participants who participated in the research are presented. Then, the findings obtained from the measurement model and structural model analyses are presented in tables.

**Table 1. Demographic Characteristics of Participants**

n: 399	Variable	Frequency	%
Gender	Female	141	35,3
	Male	258	64,7
Age	18-24	377	94,5
	25-34	14	3,5
	35-44	5	1,3
	45 and over	3	0,8
Grade (Bachelor's)	Grade 1	155	38,8
	Grade 2	84	21,1
	Grade 3	70	17,5
	Grade 4	90	22,6
Income (Monthly)	8.000 TL and below	81	20,3
	8.001-12.000 TL	75	18,8
	12.0001-16.000 TL	74	18,5
	16.001-20.000 TL	53	13,3
	20.001-24.000 TL	48	12
	24.001 and above	68	17
Ownership of a computer, tablet etc.	Yes	285	71,4
	No	114	28,6

## Data Analyses

In this study, data were analysed using Smart PLS 4. Firstly, Structural Equation Modelling (SEM) method was applied for the analyses. SEM tests the series of relationships between one or more independent variables and one or more dependent variables (Gürbüz and Şahin, 2017: 337). In the study, it was examined whether digital literacy has an effect on innovativeness, innovativeness has an effect on entrepreneurship, digital literacy has an effect on entrepreneurship

and whether innovativeness has a mediating role in the effect of digital literacy on entrepreneurship. The analyses were conducted by taking into account the values specified by Hair et al., (2014) and Hair et al., (2006). Table 2 provides details of the reflective measurement model evaluation, including factor loadings, internal consistency assessment, composite reliability and convergent validity. According to Hair et al. (2006), factor loadings should be greater than 0.7. Therefore, the statements with factor loadings less than 0.7 were excluded from the analysis. The analysis was continued with the statements with factor loadings above 0.7. Thus, it can be said that convergent validity was achieved. In the study, construct reliability was tested with Cronbach Alpha and composite reliability (CR). According to Hair et al. (2006; 2014), Cronbach Alpha coefficient and composite reliability (CR) above 0.7 are acceptable. When Table 2 is analysed, it is observed that these coefficients are at the specified level. Thus, the construct validity of the research is ensured. According to Hair et al. (2006; 2014), the average variance extracted (AVE) values should be greater than 0.5. When Table 2 is carefully analysed, it is seen that the AVE values are greater than 0.5 and exceed the threshold values. This ensures convergent validity.

**Table 2. Measurement Model**

Construct	Item	Measure	Loading (>0.7)	Cronbach's Alpha (>0.7)	AVE (>0.5)	CR (>0.7)	Adapted from
Digital Literacy	Q1	I know how to solve the technical problems I encounter with the technologies I use.	0.827	0.746	0.661	0.753	Üstündağ et al., (2017)
	Q2	I can easily learn new technologies (Ex: Artificial Intelligence, 5G, IoT, Blockchain etc.)	0.795				
	Q3	I am confident in the searches and evaluations I make to obtain information from the Internet.	0.817				
Innovativeness	Q1	I search for and allocate resources for new ideas.	0.730	0.776	0.600	0.784	Bayındır and Demir, (2019)
	Q2	I come up with creative ideas.	0.822				
	Q3	I am innovative.	0.818				
	Q4	I research new technologies, processes, techniques and generate ideas.	0.721				
Entrepreneurship	Q1	I can make the most of the opportunities that come my way.	0.746	0.840	0.611	0.844	Çuhadar and Altinel, (2016)
	Q2	I can make effective decisions about the future in a workplace.	0.816				
	Q3	I have strong motivation and inclination for different jobs.	0.821				
	Q4	I can create options in difficult situations.	0.728				
	Q5	I think I can shape my life with my decisions.	0.792				

According to Fornell and Larcker (1981), the difference of a construct in the research from other constructs is measured by discriminant validity. The AVE square root coefficient of each variable should be greater than the correlation

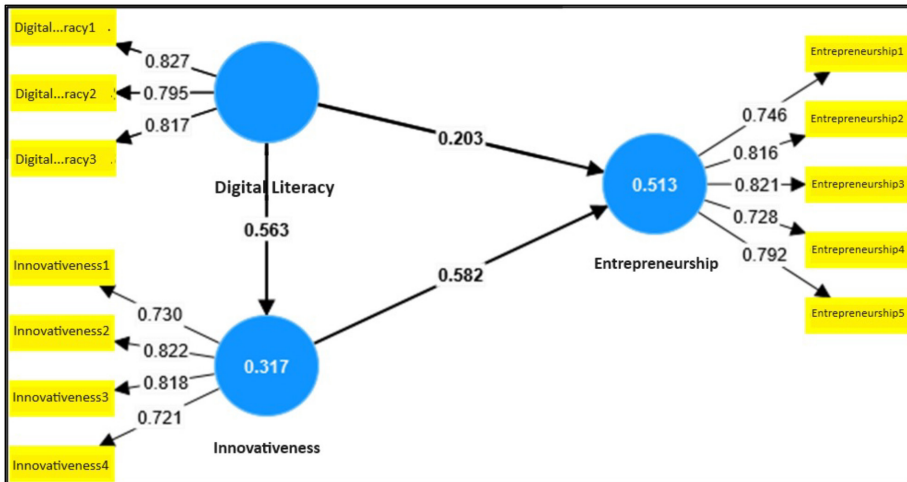
coefficient of the variable with other variables. According to Fornell and Larcker's (1981) criteria, when the discriminant validity values in Table 3 are analysed, it is seen that these values are at the desired level. These values are indicated in bold in Table 3.

**Table 3. Discriminant Validity**

	Digital Literacy	Entrepreneurship	Innovativeness
Digital Literacy	<b>0.813</b>		
Entrepreneurship	0.531	<b>0.782</b>	
Innovativeness	0.563	0.696	<b>0.774</b>

### Structural Model

As can be seen from the structural model in Figure 1, the relationships between digital literacy and innovation and entrepreneurship were examined to realise the research scope. Figure 1 shows the relationship between the constructs and the results of SEM-PLS path algorithm.



**Figure 2. Structural Model**

The results of the statistical analysis show that the four hypotheses that digital literacy significantly and positively affects innovativeness and entrepreneurship are accepted.

**Table 4. Hypothesis Tests**

Paths	Path Coefficients ( $\beta$ )	Standard deviation	T statistics	P values	R-square	Hypothesis
Digital Literacy -> Innovativeness	0.563	0.044	12.914	0.000	0.317	Accepted
Innovativeness -> Entrepreneurship	0.582	0.047	12.273	0.000	0.513	Accepted
Digital Literacy -> Entrepreneurship	0.203	0.055	3.700	0.000	0.513	Accepted
Digital Literacy -> Innovativeness -> Entrepreneurship	0.328	0.039	8.402	0.000	0.317	Accepted

According to Hair et al. (2016), the available data set can be increased to test the significance levels of the hypotheses of the research. In order to increase the available data set, Bootstrapping technique, which is called pre-loading with 5000 samples, was applied. The data obtained are presented in Figure 1 and Table 4. According to the data in Figure 1 and Table 4, it is seen that the digital literacy tendencies of tourism faculty undergraduate students have a positive effect on their innovativeness tendencies ( $\beta=0.563$ ,  $T=12.914$ ,  $p<0.05$ ). Thus, H1 is accepted. According to the data in Figure 1 and Table 4, it is seen that tourism faculty undergraduate students' innovativeness tendencies have a positive effect on their entrepreneurship tendencies ( $\beta=0,582$ ,  $T=12,273$ ,  $p<0,05$ ). Thus, H2 is accepted. According to the data in Figure 1 and Table 4, it is seen that digital literacy tendencies of tourism faculty undergraduate students have a positive effect on their entrepreneurship tendencies ( $\beta=0,203$ ,  $T=3,700$ ,  $p<0,05$ ). Previous studies in the literature (Zeynalov, 2022; Kurt Demircan and Katisöz, 2022) support this result. Thus, the hypothesis H3 is accepted. According to the data in Figure 1 and Table 4, it is seen that innovativeness ( $\beta=0.328$ ,  $T=8.402$ ,  $p<0.05$ ) has both a mediating and positive effect on the effect of digital literacy tendencies of tourism faculty undergraduate students on their entrepreneurship tendencies. As a result, all hypotheses were accepted.



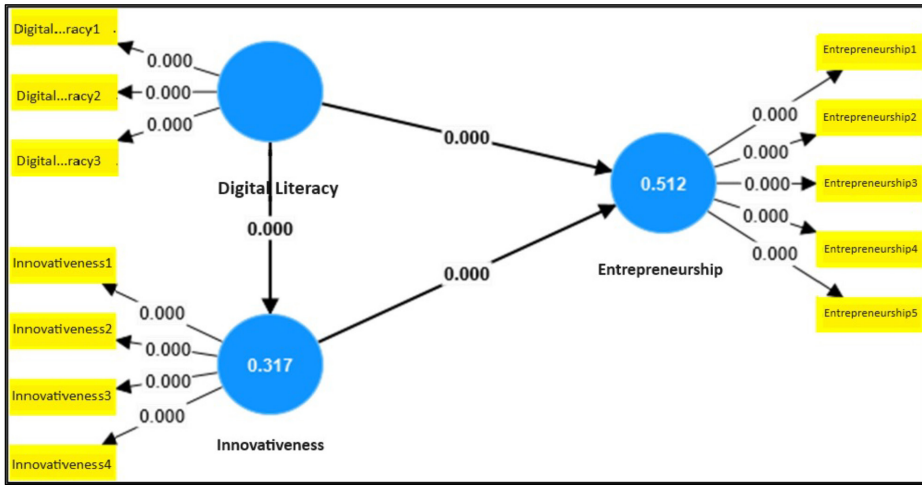


Figure 3. Structural Model (P values)

## Conclusion

In this study, it was examined whether digital literacy has an effect on innovativeness, innovativeness has an effect on entrepreneurship, digital literacy has an effect on entrepreneurship and whether innovativeness has a mediating role in the effect of digital literacy on entrepreneurship.

As a result of the analysis, it is seen that digital literacy tendencies of tourism students have a positive effect on their innovativeness tendencies. Thus, H1 is accepted. The result of this study supports the importance of specialization on digital literacy and innovativeness (Dominguez et al., 2021). Because the hybrid education system that is being used today requires digital literacy.

Digital literacy increases the opportunities for people to be aware of global innovations and to have new ideas thanks to the information gained. Having new ideas encourages new initiatives. In this way, with the increase in digital literacy, tourism students will be more likely to be open to innovations/new ideas and to turn their new ideas into initiatives.

With another analysis, it was determined that tourism students' innovativeness tendencies have a positive effect on their entrepreneurial tendencies. Thus, H2 is accepted. Previous studies in the literature (Ataei et al., 2024; Manzi-Puer-

tas et al., 2024) directly and indirectly support this result. However, this desire of a person who has an innovativeness tendency and wants to be an entrepreneur is not sufficient for entrepreneurship. Previous literature indicated that lack of capital and experience are the most important barriers to tourism entrepreneurship in Mureithi's (2010) study on tourism and hotel management students in South Africa. In this context, it is thought that it would be beneficial for the government to provide special loans and grants to tourism students and that more young entrepreneurs may be able to enter the sector as entrepreneurs through entrepreneurship training in tourism.

In another analysis, it was determined that digital literacy tendencies of tourism students have a positive effect on their entrepreneurial tendencies. Previous studies in the literature (Zeynalov, 2022; Kurt Demircan & Katisöz, 2022) support this result. Thus, the hypothesis H3 is accepted. In another study (Soliman, 2011), it was revealed that tourism undergraduate students in Egypt have the intention to start their own business after graduation, but the lack of entrepreneurship education is another important finding. In Türkiye, it is seen that entrepreneurship courses and courses related to digitalization are taught as elective courses in many universities and departments. It is thought that both entrepreneurship course and courses related to digitalization should be taught as compulsory courses both in tourism departments and in other departments with industry connections. This idea is supported by the finding of Imjai et al. (2024) that digital literacy skills should be integrated into the curriculum, especially in the digital age, in order for students to effectively adapt to the evolving demands of the accounting profession.

The final analysis revealed that innovativeness has both a mediating and positive effect on the effect of digital literacy tendencies of tourism students on their entrepreneurial tendencies. Thus, H4 is accepted. As a result, all hypotheses were accepted. The difference of the study from other studies is that the innovativeness variable is used together with digital literacy and entrepreneurship variables. Because these variables have not been used together before. Therefore, there is no study that supports the hypothesis H4. This gap in the literature is tried to be filled with the findings of the study.

It would be an expected behaviour for people who have become digitally literate and have an innovative structure or tendency in this regard to use their

knowledge as entrepreneurs. As a result of the analysis, it was determined that digitalization has a positive effect on the tendency to innovate. In this context, in order for tourism students to have an entrepreneurial spirit and to have high courage in entrepreneurship, it is thought that increasing their knowledge and experience in digitalization will be effective in both their innovativeness tendencies and entrepreneurship tendencies. The study contributes to the determination of digital literacy, innovativeness and entrepreneurship tendencies of tourism students and to reveal the relationships among these variables. Since the relationships among these variables are determined in the model tested in the research, the requirements that tourism students will need in order to achieve the tendencies can be revealed. In this direction, the study provides guidance for future studies by determining the tendencies of tourism students.

This study has some limitations. First of all, conducting the study in Nevşehir province is one of the most important limitations. Conducting future studies on a regional or country basis in order to create a more inclusive framework can make significant contributions to the literature. Another limitation is the use of the survey technique. Future studies may use observation technique to measure digital literacy, innovativeness and entrepreneurial tendencies in order to investigate the issue more comprehensively.

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