

# Determining Young People's Artificial Intelligence Anxiety Levels and Attitudes Towards Digital Technologies

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**Abstract:** Nowadays, the usage area of digital technologies is increasing every day. One of the digital technologies that have emerged recently and started to enter our lives in a partially new way is artificial intelligence. On the other hand, artificial intelligence causes anxiety in people due to its rapid development and increasing use. In this research, the technology attitudes and artificial intelligence anxiety levels of a group of participants, including working or non-working individuals who use technology more widely, were investigated. In this context, data was collected from 296 young individuals. To collect data, the attitude scale towards digital technologies and the artificial intelligence anxiety level determination scale were used. As a result of the research, young people's attitudes towards technology and artificial intelligence anxiety levels were found to be moderate. According to gender, while men have a higher technology attitude than female, they have a higher level of artificial intelligence anxiety. While working individuals have more technology attitudes, working status is not an important factor in terms of artificial intelligence anxiety. A low-level and positive relationship was found between the level of artificial intelligence anxiety and attitudes towards digital technologies.

**Keywords:** Yapay Zeka, Teknoloji Tutumu, Gençler, Yapay Zeka Kaygısı.

## 1. Introduction

One of the concepts that has rapidly gained a place in today's technological developments and is increasingly increasing its impact is artificial intelligence. Although the emergence and use of artificial intelligence dates back to the 1950s (Mintz & Brodie, 2019), its development has accelerated and its usage areas have increased in recent years. Although artificial intelligence attracts attention especially with its applications in mobile technologies, it is used effectively in many areas, from decision-making processes to production processes (Khanzode & Sarode, 2020).

Although there is no definition accepted by everyone with the widespread research, Minsky (1991), one of the leading researchers in this field, focuses on the concept of "intelligence" and defines artificial intelligence as the ability to solve difficult problems simply. Looking at its historical background, the concept of artificial intelligence first appeared in a paper presented by John McCarthy, Marvin L. Minsky, Nathaniel Rochester and Claude E. Shannon at the Dortmund Conference in 1956, and John McCarthy is considered to be the person who introduced this concept there. (Mintz & Brodie, 2019). Artificial intelligence is the ability of machines to adapt to new situations, deal with emerging situations, solve problems, answer questions, organize plans, and perform a variety of other functions that require a certain level of intelligence typically seen in humans (Coppin, 2004). Artificial Intelligence is defined as a branch of science and technology that imitates human thinking processes, creates smart machines and computer programs to do this, and uses big data and machine learning systems in accordance with its purpose (Kelly, Kaye and Oviedo-Trespalacios, 2023). In general terms, it is possible to define artificial intelligence as a concept that is a series of computer programs, includes areas such as machine learning, produces solutions by making decisions for a problem in the field in which it is developed instead of a human being, and can perform these operations effectively by using features such as high processing speed of the computer.

### 1.1. Artificial Intelligence Applications

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Artificial intelligence is used in many different areas depending on the data it processes, the type of output desired to be obtained, and the algorithm structure in which it is developed, and it has become a part of daily life for people in all segments of society (Pannu, 2015). Voice assistants in phones and vehicles used during the day perceive and respond to navigation users' commands and carry out the tasks transmitted, creating great convenience and comfort for the users. Google Assistant, Siri, Amazon Alexa and Cortana are important examples in this context. It has begun to shape life in different areas, from daily activities to business life, from the entertainment industry to lifestyles (Altun, 2019).

Artificial intelligence is used in many different sectors and applications. In recent years, in addition to popular applications such as chat, image and audio processing such as ChatGPT, Dalle, Gemini, Bard, social media platforms have been able to offer their own special artificial intelligence applications. In addition, it can be stated that artificial intelligence is now used in a wide range of areas in life, from applications that replace customer services of mobile banking services to stock market transactions, from educational coaching to foreign language teaching processes, from determining traffic light crossing priority to disease diagnosis processes with image processing (Varian, 2018).

As artificial intelligence technologies develop and become widespread in different areas, it is seen that fear and anxiety emerge among people (Sindermann et al., 2022). Bostrom (2002) states that artificial intelligence, which he classifies together with nuclear energy and nanotechnological systems, poses a risk to the existence of human beings. From autonomous vehicles to the entertainment industry, from military and agricultural applications to different occupational structures, especially robotized artificial intelligence tools, raise many questions for human beings, such as ethical problems, uncertainty about life, and occupational concerns (Li & Huang, 2020). On the other hand, Johnson and Verdicchio (2017) stated that there are concerns that artificial intelligence may get out of control and pose a threat to human life. Wang and Wang (2022), who developed a measurement tool for young people regarding artificial intelligence anxiety, stated that it has four dimensions, especially among young people: learning of artificial intelligence, structuring of artificial intelligence, change in business life and sociotechnical blindness. In this respect, it can be stated that the uncertainty of artificial intelligence applications and its impact on the future from different perspectives causes concern about artificial intelligence.

Chen, Chen and Lin (2020) state that with the development of computer and information communication technologies over the years, artificial intelligence has turned into today's applications. In other words, digital technological tools have played an important role in the development of artificial intelligence. In this respect, considering that attitude, one of the parameters towards technology, will have a possible impact on anxiety towards artificial intelligence, it was deemed important to investigate young people's attitudes towards technology and their concerns towards artificial intelligence.

## **1.2. Purpose of the research**

The aim of this research is to determine the artificial intelligence anxiety levels of young people and their attitudes towards technology and the relationship between these two variables. In this context, answers to the following questions were sought;

1. What are young individuals' attitudes towards digital technologies and their level of anxiety about artificial intelligence?
2. Do young individuals' attitudes towards digital technologies and artificial intelligence anxiety levels differ according to gender and whether they work or not?
3. What is the relationship between young individuals' attitudes towards digital technologies and their level of anxiety about artificial intelligence?

## **2. Method**

This section contains information about the research method.

### **2.1. Research Model**

The research is designed with a quantitative method and is a study carried out with the relational scanning model, one of the scanning models. The relational scanning model is used to determine the presence and degree of change between two or more variables (Fraenkel, Wallen & Hyun, 2012), thus allowing the determination of tendencies such as

attitude and anxiety (Creswell, 2017). In this context, the relationship between young people's attitudes towards technology and their concerns about artificial intelligence and these variables was determined.

## 2.2. Population and Sample

The population of the research consists of young individuals who are in Konya province in 2023 and are studying at the education center of the Metropolitan Municipality. Approximately 2000 young individuals are studying in the relevant unit. Since it was not possible to collect samples from the entire universe in the research, a sample was taken. With the simple random sampling method, the application was made to 2 classes each from 4 different course centers located in different places. Simple random sampling method is a sampling method in which all units have an equal chance of selection, and in practice, all units are listed and selection is made from random units (Martino, Luengo & Míguez, 2018). In this context, data was collected from 296 participants who were in randomly determined classes and agreed to participate in the research voluntarily. Demographic information about these participants is given in Table 1.

**Table 1.** Demographic Information of Participants

Variables		f	%
Gender	Female	207	70
	Male	89	30
Working Status	Working	148	50
	Student	101	34
	Non Working	47	16
<b>Total</b>		<b>296</b>	<b>100</b>

When Table 1 is examined, it is seen that 70% of the participants are female and 30% are men. When examined in terms of their employment status, it can be seen that 50% of them are working, 16% are not working, and 34% are students.

## 2.3. Data Collection Tool and Data Collection

In addition to personal information, attitude scale towards technology and artificial intelligence anxiety level determination scales were used to collect data. The Attitude Scale Towards Digital Technology was developed by Cabi (2016). The measurement tool, developed with a total of 689 participants, consists of 8 factors (competence, social networks, educational technology use, interest, technology for me, negative aspects, entertainment use and conscious use) and 39 items. The other measurement tool is the artificial intelligence anxiety scale developed by Wang and Wang (2019) and adapted to Turkish by Akkaya, Özkan and Özkan (2021). To determine the reliability of the scale, which consists of 4 factors (Learning, Job Changing, Sociotechnical Blindness and Configuration) and 16 items, the Cronbach Alpha coefficient was expressed as 0.93. In this study, the Cronbach Alpha coefficient was calculated as 0.95. Permission was obtained for the use of the scales.

## 2.4. Analysis and Interpretation of Data

Descriptive statistics such as percentage, frequency, mean and standard deviation were used in the analysis of demographic information, technology attitudes and artificial intelligence anxiety levels. While the Independent Sample T test was used to determine the differences in technology attitudes and artificial intelligence anxiety levels according to gender, One-Way Analysis of Variance (ANOVA) was used to determine the difference according to working status. To determine the relationship between attitudes towards digital technologies and artificial intelligence anxiety level, Pearson Product Moment Correlation coefficient was examined.

Three evaluation criteria were adopted in the interpretation of the 5-point Likert-shaped items: low, medium and high. In this context, in accordance with the formula (highest - lowest) / number of evaluation criteria, 1.00 - 2.33 is interpreted as low, 2.34 - 3.66 is medium and 3.67 - 5.00 is interpreted as high.

## 3. Findings

The findings of the research should be included in a separate section of the article, as it is the only section that contains data and results of the analysis.

### 3.1. Young People's Attitudes Towards Digital Technologies and Artificial Intelligence Anxiety Levels

In line with the first purpose of the research, the answers given by 296 participants regarding their Attitudes towards Digital Technology and Artificial Intelligence Anxiety Levels were analyzed, and the findings are given in Table 2 and Table 3.

**Table 2.** Young People's Attitudes Towards Digital Technologies (N=296)

Scale Factors	$\bar{X}$	Sd	Attitude Level
Competence	3,65	,675	Middle
Social networks	3,41	,876	Middle
Use of educational technology	3,97	,857	High
Interest in technology	4,03	,673	High
Technology for me	4,14	,591	High
Negative aspects	2,52	,861	Middle
Recreational use	2,63	,919	Middle
Conscious use	4,22	,592	High
<b>Overall average</b>	<b>3,55</b>	<b>,423</b>	<b>Middle</b>

When Table 2 is examined, it is found that the general technology attitude average of young people is at a medium level ( $\bar{X}$ =3.55). When examined in terms of sub-factors, educational technology use ( $\bar{X}$ =3.97), interest in technology ( $\bar{X}$ =4.03), technology for me ( $\bar{X}$ =4.14) and conscious use ( $\bar{X}$ =4.22) dimensions have high attitudes. On the other hand, they have medium level technology attitudes in the dimensions of competence ( $\bar{X}$ =3.65), social networks ( $\bar{X}$ =3.41), negative aspects ( $\bar{X}$ =2.52) and recreational use ( $\bar{X}$ =2.63).

**Table 3.** Artificial Intelligence Anxiety Levels of Young People (N=296)

Scale Factors	$\bar{X}$	Sd	Anxiety Level
Learning	3,41	1,066	Middle
Changing Jobs	2,67	1,054	Middle
Sociotechnical Blindness	2,44	1,025	Middle
Artificial Intelligence Configuration	2,76	1,261	Middle
<b>Overall Average</b>	<b>2,86</b>	<b>,931</b>	<b>Middle</b>

When artificial intelligence is examined in terms of anxiety levels, it can be seen that young people have a medium level of anxiety in all dimensions (Table 3). An average of  $\bar{X}$ =2.86 was found for the general anxiety level,  $\bar{X}$ =2.67 for the learning dimension,  $\bar{X}$ =2.44 for the sociotechnical blindness dimension, and  $\bar{X}$ =2.76 for the artificial intelligence configuration dimension.

### 3.2. Young People's Attitudes Towards Digital Technologies and Artificial Intelligence Anxiety Levels According to Demographic Variables

In line with the second sub-objective of the research, young people's attitudes towards digital technology and artificial intelligence anxiety levels were examined in terms of different variables. In this context, it was primarily investigated whether there were differences according to gender (Table 4).

**Table 4.** Technology Attitudes and Artificial Intelligence Anxiety Levels of Young People by Gender

Variables	Group	N	$\bar{X}$	Sd	t	df	p
Technology Attitude	Female	207	3,47	,366	-5,179	294	,000*
	Male	89	3,74	,486			
Artificial Intelligence Anxiety	Female	207	2,77	,886	-2,549	294	,011*
	Male	89	3,07	1,004			

\* p&lt;.05

Tablo 4'ten görüleceği üzere, öğrencilerin teknoloji yönelik tutumları ( $t_{(294)}=-5.179$ ;  $p<0.05$ ) ile yapay zeka kaygı düzeylerinin ( $t_{(294)}=-2.549$ ;  $p<0.05$ ) her ikisi de cinsiyete göre farklılaşmaktadır. Teknolojiye yönelik tutumlar açısından erkekler ( $\bar{X}=3,74$ ) kadınlara ( $\bar{X}=3,47$ ) oranla daha yüksek tutuma sahiptirler. Yapay zeka kaygı düzeyleri açısından incelendiğinde ise erkeklerin ( $\bar{X}=3,07$ ) kadınlardan ( $\bar{X}=2,77$ ) daha fazla kaygı düzeyine sahiptirler.

Araştırma kapsamında gençlerin dijital teknolojilere yönelik tutumları ile yapay zeka kaygı düzeyleri çalışıp çalışmama durumuna göre de incelenmiştir (Tablo 5). Bu kapsamda 296 öğrencinin 148'i çalıştığını ifade ederken, 47'si çalışmadığını, 101'i ise öğrenci olduğunu belirtmiştir.

**Table 5.** Technology Attitudes and Artificial Intelligence Concerns of Young People According to Their Working Status

Variables	Values	N	$\bar{X}$	Sd	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	Difference
Technology Attitude	1- Working	148	3,64	,428	Between Groups	2,049	2	1,024	5,902	,003*	1-2, 1-3
	2- Student	101	3,48	,427	Within Groups	50,851	293	,174			
	3-Non Working	47	3,46	,346	Total	52,899	295				
Artificial Intelligence Anxiety	1- Working	148	2,88	,930	Intergroup	,290	2	,145	,166	,847	-
	2- Student	101	2,82	,985	Within Groups	255,818	293	,873			
	3-Non Working	47	2,82	,826	Total	256,108	295				

\* p&lt;.05

When Table 5 is examined, it is seen that there is a difference between young people's technology attitudes according to their working status ( $F_{(2-293)}=5.902$ ;  $p<0.05$ ), but there is no difference between their artificial intelligence anxiety levels ( $F_{(2-293)}=0.166$ ;  $p>.05$ ) was seen. According to the results of the Post-Hoc test conducted to determine the difference in terms of attitudes towards digital technology ( $\bar{X}=3,64$ ), it was concluded that the attitudes of working young people towards digital technologies were higher than those of non-working people ( $\bar{X}=3,48$ ) and students ( $\bar{X}=3,46$ ).

### 3.2. Determining the Relationship Between Young People's Attitudes Towards Digital Technologies and Artificial Intelligence Anxiety Levels

Finally, the research examined the relationship between young people's attitudes towards digital technologies and their artificial intelligence anxiety levels (Table 6).

**Table 6.** The Relationship Between Young People's Attitudes Towards Technology and Artificial Intelligence Anxiety Levels

	Competence	Social Networks	Educational Technology Use	Interest in Technology	Technology for Me	Negative Aspects	Recreational Use	Conscious Use	Technology Attitude
Learning	,219**	,013	,193**	,264**	,267**	-,468**	-,085	,182**	,103
Changing Jobs	,209**	,054	,138*	,130*	,132*	-,338**	,128*	,078	,120*
Sociotechnical Blindness	,174**	,068	,105	,030	,056	-,217**	,173**	-,023	,101
Artificial Intelligence Configuration	,191**	,010	,077	,151**	,151**	-,214**	,106	,090	,126*
Artificial Intelligence Anxiety	,234**	,041	,157**	,178**	,186**	-,377**	,080	,104	,131*

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed)

When Table 6 is examined, it is seen that there is a low-level and positive relationship between young people's attitudes towards digital technology and their anxiety levels towards artificial intelligence ( $r = 0.131$ ;  $p < .05$ ). When examined in terms of sub-dimensions, it can be stated that there is only a moderate and inverse relationship between the negative aspects of digital technologies and artificial intelligence anxiety ( $r=-0.377$ ;  $p<0.05$ ). The relationships in all other dimensions are low-level and positive.

### 3. Results and Discussion

The following results were obtained in this research, which investigated young people's attitudes towards digital technologies and their anxiety levels towards artificial intelligence.

It was observed that the participants had a moderate attitude towards digital technologies. The use of digital tools in education and the popularization of social media have caused the attitude towards digital technology to be at a moderate level, stating that by facilitating young people's access to digital technology, it can increase the educational success of young people and also affect their attitudes towards digital technology (Sezgin, Erdoğan, & Erdoğan, 2017). The attitudes of young people can be influenced by the use of digital technology synthesizing educational digitalization on social media. In terms of sub-dimensions, it was observed that they had a high level of technology attitude in the dimensions of conscious use, technology for me, interest in technology and educational technology use. On the other hand, it was concluded that there is a moderate level of technology attitude regarding competence, social networks, negative aspects and use of technology for entertainment purposes. In order to increase the conscious use of technology in lower dimensions, the use of technology in education should be supported and strengthened. Demirer and Dikmen (2018) stated that technological contribution provides a positive contribution to technology. Korkmaz (2017) stated that lack of technology, especially in educational environments, can cause negative consequences.

When examined in terms of artificial intelligence anxiety levels, it was seen that there was a moderate level of anxiety in both the general artificial intelligence anxiety level and the sub-dimensions of learning, job switching, sociotechnical blindness and artificial intelligence configuration. While artificial intelligence creates uncertainty and uncertainty in terms of the uncontrolled progress of technological developments, it raises concerns about the meaningful beneficial developments it adds to our lives, the speed and development in business life, and the speed and development in business life. Turley (2020) states that the uncertainty caused by technology-related changes causes anxiety. Rhee and Jin (2021) state that artificial intelligence technologies will cause radical changes, and the uncertainty experienced in this newly shaped transformation today creates anxiety. In this respect, it can be considered natural that there is concern due to the uncertainty about developing artificial intelligence technologies.

While employment status is an important factor in terms of attitudes towards technology, it is not a significant factor in anxiety towards artificial intelligence. Working individuals have more technology attitudes than other individuals (non-working people and students). Work situations may have increased participants' opportunities to access technology. Jan and Van (2017) stated that employment status may also be a cause of digital divide in terms of access opportunity. Van Deursen and Helsper (2015) stated that there is a status-based digital divide in digitalization, including working life. In other words, opportunities or experiences gained in working life may have increased attitudes towards technology. On the other hand, the lack of differentiation in anxiety towards artificial intelligence may be due to the uncertainty expressed by Turley (2020) and Rhee and Jin (2021). The fact that artificial intelligence applications are new and not experienced enough may have caused no difference in terms of gender.

It was found that there is a low-level and positive relationship between young people's attitudes towards digital technologies and their anxiety levels towards artificial intelligence. When the literature was examined, no studies were found regarding artificial intelligence anxiety levels and attitudes towards digital technologies. Artificial intelligence anxiety is a topic that has just begun to be studied in the literature. The research results were predicted with concepts close to artificial intelligence concern. When concepts that are close to artificial intelligence concerns and will directly affect the attitude towards digital technologies are given as examples; Studies on the concepts of artificial intelligence anxiety and digital technology use anxiety (Akkaya, Özkan and Özkan, 2021; Chiu and Churchill, 2016; Bilgici and Ünver, 2021; Takıl, Arden and Sari, 2022) attract attention. The common point of these studies is that the use of digital technology creates a concern. In this respect, it can be considered natural that there is a low level of relationship between the use of digital technology and artificial intelligence anxiety, which includes uncertainty.

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#### Conflict of Interest

it has been reported by the authors that there is no conflict of interest.

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