

E-LEARNING STYLES AS A PREDICTOR FOR ATTITUDES TOWARDS DISTANCE EDUCATION: A RELATIONAL RESEARCH WITH THE TEACHER CANDIDATES

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Received: 19/03/2024 **Accepted:** 26/08/2024

ABSTRACT

Students' attitudes towards distance education can be shaped by the compatibility of their learning styles with this new educational environment. The study aimed to investigate whether various variables and e-learning styles predict student's attitudes towards distance education. The present research was conducted on 387 students enrolled in the education faculty of a state university in Türkiye. The Distance Education Attitude Scale and the E-Learning Styles Scale were used to gather information about participants' gender, preferences for the type of education, monthly internet package, and purposes of internet use. This research is a type of relational research that determines the prediction of relationships between quantitative variables. Stepwise multiple regression analysis was employed in the research. Findings show that the preferred type of education, gender, visual-auditory learning style, and independent learning style predict the attitude toward distance education. In conclusion, this research sheds light on how student-centered distance education models can evolve in the process of digital transformation in education.

Keywords: Distance education, learning, e-learning styles, attitudes, teacher candidates.

INTRODUCTION

The COVID-19 pandemic led to the closure of schools in many countries worldwide. This extraordinary situation highlighted the limitations of traditional face-to-face instruction. To ensure the continuity of education, many institutions began offering remote learning opportunities by adopting education-focused technologies (Can, 2020). The widespread use of distance education and e-learning environments during this process became not just a preference but a necessity. With the proliferation of distance education, there arose a need for research to identify factors influencing learning (Alqurashi, 2019). Regardless of whether students learn face-to-face or remotely, several factors impact the learning process. One of these factors is the learning styles individuals possess. Learning style refers to determining which instructional or study method is more effective in individuals' learning processes (Ozdemir & Kaptan, 2017). Each student has different learning styles based on their characteristics (Ozdemir, 2011). According to Keefe (1979), learning style encompasses cognitive, affective, and psychological behaviors that demonstrate how individuals perceive learning environments, interact with these environments, and respond in such environments. Additionally, Briscoe, Schuler, and Claus (2008) define learning style as an approach that individuals have and are most comfortable with, depending on the culture in which they were raised. Learning style is an inherent trait and remains almost unchanged throughout an individual's life (Kaplan & Kies, 1995). When an individual

recognizes their learning style, they have the opportunity to effectively use it in the learning process. Buckley and Caple (2007) define learning styles as individuals' tendencies to turn to different activities and approaches for learning, emphasizing that these differences are significant factors influencing learning. It is important to consider the teaching methods adopted by students in remote learning environments. Prioritizing these methods by instructors can positively impact students' academic development. There are numerous classifications of e-learning styles in the literature.

Dunn and Dunn (1979) propose that learning styles are based on individual preferences in five areas: a) environment, b) emotionality, c) sociological preferences, d) physiological characteristics, and e) psychological processing inclinations. Felder and Silverman (1988) categorize learning styles into five dimensions: sensory and intuitive, visual and auditory, inductive and deductive, active and reflective, sequential and global. Independent learning involves self-study, social learning involves interactive group activities, visual-auditory learning entails learning by listening to elements such as pictures, tables, graphics, etc., active learning is best done by doing-experiencing, verbal learning is most effective through reading, logical learning involves enjoying activities requiring calculation, and intuitive learning involves associating the learning object with emotions, among other behaviors. In this context, the extent to which current technologies offer options suitable for different learning styles determines the boundaries of students' e-learning styles. In other words, the more reachable the above-classified learning styles are in e-learning, the more learning opportunities there are for students. Barbrow et al. (1996) have stated that a distance education program considering students' learning styles can enhance their achievements and participation. Similarly, in a study evaluating the effects of learning styles in distance education, Binner (1997) demonstrated that encountering materials suitable for different learning styles can enrich students' learning experiences. Furthermore, Ekici (2003) suggested that a distance education program based on students' learning styles can increase learning motivation by promoting more interaction among students. By identifying learners' characteristics and needs, e-learning experiences can be personalized, thereby enhancing learners' performance (Kurnaz & Ergun, 2019). From this perspective, it can be said that students' learning styles are influenced by both internal and external variables, with this influence intensifying on the internal factors in remote education platforms. Therefore, an individual's attitude towards education may have an impact on e-learning. This study investigates the relationship between prospective teachers' e-learning styles and their attitudes towards distance education. The research seeks to answer the question, "Are e-learning styles, gender, preferences for the type of education, monthly internet package, and the most common purposes of internet use predictors of the attitude towards distance education?"

Attitudes are emotional orientations that guide individuals' behaviors. The attitudes teachers possess are among the significant factors that influence the behaviors they exhibit while practicing the teaching profession. The attitudes and behaviors of teachers are crucial for the success of the implemented teaching program. Research conducted on distance education indicates that students' attitudes towards distance education are at a moderate level (Yenilmez et al., 2017; Ekici et al., 2022; Karadag & Yucel, 2020; Yildiz, 2016). Yahsi and Kirkic (2020) stated in their study that those with a good level of technology use also have a high attitude towards distance education.

Researchers investigating the impact of distance education and face-to-face learning environments on student performance emphasize the effectiveness of learning styles in distance education. In their study, Senturk and Cigerci (2018) found significant differences in e-learning styles based on variables such as gender, professional experience, and educational status. They also noted that participants showed a dominance of visual-auditory learning styles. Beadles and Lowery (2007) drew attention to differences in learning styles between students who prefer traditional learning environments and those who prefer web-based learning environments. They highlighted that web-based learning environments are as effective as traditional learning environments but students who prefer web-based learning environments exhibit a more intuitive learning style compared to those who prefer traditional education settings. Ozgur and Tosun (2010) emphasized the positive impact of internet-supported education on e-learning attitudes.

With the onset of the COVID-19 pandemic, the use of e-learning applications in education became widespread, making students' e-learning styles and attitudes towards distance education more crucial for academic success in remote learning environments. In this context, considering e-learning styles in distance education settings is important. However, more research is needed to gain a more detailed understanding of the relationship between e-learning styles and distance education (Heaton-Shrestha et al., 2007). The

insufficient number of studies in the literature explaining the relationship between e-learning style and attitudes toward distance education makes this study even more significant. In this context, the researchers aimed to make a new contribution to the relevant literature.

METHOD

Research Design

This research is a type of relational research that determines and allows the prediction of relationships between two or more quantitative variables without intervening. Although it is possible to show the diversity between variables in relational research, this relationship is not causal. Relational research has two main purposes. The first is to describe relationships between variables, and the second is if there is a sufficiently large relationship between two variables and the score of one variable is known, to predict the score of the other variable (Fraenkel, Wallen, & Hyun, 2012).

Participants

The population of the study consists of 387 teacher candidates enrolled in the education faculty of a state university. The sample size was determined using the Raosoft sample size calculator (<http://www.raosoft.com/sampleSize.html?nosurvey>) with a Confidence Level of 95% and Confidence Interval values of 95% and 5%, respectively. Research data were collected through convenience sampling, a type of non-probability sampling method. In convenience sampling, the researcher begins to form the sample with the easiest accessible respondents (Cohen, Manion & Morrison, 2018). As a result, online access was established with the 387 teacher candidates who volunteered for the study.

Numeric information regarding the characteristics of teacher candidates and the independent variables to be examined in the research are presented in Table 1 below.

Table 1. Descriptive statistics related to teacher candidates and independent variables

Variables	Groups	Frequency	%
Gender	Female	278	71.8
	Male	109	28.2
Type of education preferred	Face-to-face education	317	81.9
	Distance education	70	18.1
Monthly internet package	10GB and below	138	35.7
	11GB-20GB	156	40.3
	21GB and above	93	24.0
The most common purpose of internet usage	Social networks, games, entertainment	210	54.3
	Research-Homework	62	16.0
	Other	115	29.7

It can be observed in Table 1 that the distribution of teacher candidates across the groups is not balanced. Of the study group, 71.8% are female students, 81.9% prefer face-to-face education, 35.7% have an internet package of 10GB or less, and only 16% use the internet primarily for research and assignment purposes. Researchers were inspired by similar studies in the selection of independent variables.

Instruments

In the present study, scores obtained from the Distance Education Attitude Scale were used as a measure of the attitude towards distance education. Additionally, the E-Learning Styles Scale and Personal Information Form were used in the research. The Personal Information Form includes questions related to teacher

candidates' gender, preferences for the type of education, monthly internet package, and the most common purpose of internet use.

The Distance Education Attitude Scale was developed by Kislá (2016) for teacher candidates. The scale consists of 35 items, including 16 negative items. A 5-point Likert-type rating scale was used. Some items from the Distance Education Attitude Scale are as follows: "Distance education reduces student success," and "The lack of continuous face-to-face interaction in distance education bothers me." To determine the construct validity of the scale, Kislá (2016) applied Exploratory and Confirmatory Factor Analysis. The unidimensional scale was found to have an internal consistency coefficient of 0.89. The goodness-of-fit indices for the confirmatory factor analysis of the scale were found to be acceptable, with RMSEA= 0.021, GFI= 0.90, and CFI = 0.93. In the scope of this study, the reliability of the scale was found to be 0.89.

The e-learning styles scale for electronic environments was developed by Gulbahar and Alper (2014) with university students. It consists of seven sub-factors and 38 items, utilizing a 5-point Likert-type rating scale. The sub-factors of the scale include independent learning, social learning, visual-auditory learning, active learning, verbal learning, logical learning, and intuitive learning. Independent learning describes the learning style of individuals who mostly prefer such behaviors as studying on their own and taking responsibility for their learning with some guidance. Social learning represents the learning style of individuals who display such behaviors as engaging in interactive group activities and participating in synchronous activities such as chat, virtual classrooms, or whiteboard applications. Visual-auditory learning is the learning style of individuals who prefer learning with elements such as pictures, tables, and graphics and enjoy learning by listening. Active learning characterizes the learning style of individuals that entails such features as the belief that they learn best by doing, and the enjoyment they derive from exploring or researching. Verbal learning includes the learning style of individuals who think they learn best by reading. Logical learning is the learning style that involves such behaviors as enjoying activities requiring calculation and solving problems through analytical processes. Intuitive learning encompasses the learning style that demonstrates behaviors such as associating the learning object with emotions.

During the development of the scale, Gulbahar and Alper (2014) concluded that the model showed a good fit with the coefficients they obtained from the DFA results, with RMSEA= 0.056, GFI= 0.90, CFI= 0.98. The internal consistency coefficients of the factors of the scale range between .72 and .87. In the present study, the internal consistency coefficients of the factors in the scale were found to be .73 for Independent learning style, .77 for social learning style, .78 for verbal learning style, .74 for visual-auditory learning style, .77 for logical learning style, .61 for active learning style, and 4.9 for intuitive learning style. According to DeVellis (2012), a Cronbach's Alpha (α) coefficient above .70 is considered an acceptable reliability criterion. In scales with fewer than 10 items, low Cronbach's alpha values can be reached. In such cases, an average inter-item correlation ranging between .2 and .4 is recommended (Briggs & Cheek, 1986, cited in Pallant, 2016). In the present study, the correlation average among the items for the active learning style and among the items for the intuitive learning style were found to be .25 and .21, respectively.

Procedure

This research was approved by the Ethics Committee on 03.10.2023 under reference number 2023-8, and the data collection process was conducted by the standards of the Helsinki Declaration (World Medical Association, 2013). The authors have no financial or non-financial competing interests in this Research. All the participants were informed about the purpose of the study, the confidentiality of their voluntary participation, the assurance of keeping their responses confidential, and the collective scientific use of the data. Before responding to the online survey, participants confirmed their consent by approving an informed consent text. The data was collected on 30.10.2023 through an online survey tool accessible from any electronic device (smartphone, tablet, laptop, etc.) via Google Forms.

Data Analysis

Multiple regression analysis is highly sensitive to outliers; hence, data showing outliers should be excluded from the analysis (Pallant, 2016). Mahalanobis distance, one of the techniques used in the detection of multivariate outliers, has been identified. According to the Mahalanobis distance analysis, data from eight sets with chi-square values below $p < .001$ (Tabachnick and Fidell, 2013) were excluded. In the final state, the 'Mahalanobis Distance Values range between .581 and 19.334. As these values are less than the critical chi-square value for 13 independent variables ($df=13$) and $p=0.001$, which is 34.53, no outlier problem among the independent variables was revealed. After removing the outliers, the data related to the attitude scale towards distance education was initially examined for normal distribution. The Kolmogorov-Smirnov normality test, skewness, and kurtosis coefficients for the single-factor scale are provided in Table 2 below.

Table 2. Normal Distribution of Data from the Attitude Scale for Distance Education

Scale	Kolmogorov-Smirnov			Skewness	Kurtosis
	Statistic	df	Sig.		
Attitude toward distance education	.044	379	.077	.254	-.229

As can be observed in Table 2, the results of the Kolmogorov-Smirnov test indicate that the data for the attitude scale toward distance education show a normal distribution ($p > .05$). The Kolmogorov-Smirnov test results for learning styles, which are the independent and continuous variables of the study, did not exhibit a normal distribution. Therefore, the skewness and kurtosis values were examined. These values ranged between -1 and +1. Skewness and kurtosis coefficients within the range of -1 to +1 are considered a measure of the normality assumption (Morgan, Leech, Gloeckner & Barrett, 2004). Thus, it can be stated that the data show a normal distribution. The stepwise multiple regression analysis, an appropriate statistical technique for predictive studies, was utilized. In the study, categorical variables were included in the regression analysis by coding them as "dummy variables," while continuous variables were included in the analysis with their original values. Information about the dummy coding of all variables included in the analysis is provided in Table 3 below.

Table 3. Coding of Dummy Variables

Categorical Variables	Level	Dummy Variable	Coding	Excluded Category
Gender	1. Female	Female	Female:1	Male
	2. Male		Male:0	
Type of education preference	1. Face-to-face education	Face-to-face education	Face-to-face education:1	Distance education
	2. Distance education		Distance education:0	
Monthly internet package	Below 10GB	Below 10GB	Below 10GB:1,	21GB and above
	11-20GB		11-20GB:0	
	21GB and above	11-20GB	Below 10GB: 0, 11-20GB:1	
The most common purpose of internet use	1. Social networks, games, entertainment	Social networks, games, entertainment	Social networks, games, entertainment:1	Other
	2. Research Homework		Research Homework:0	
	3. Other	Research Homework	Social networks, games, entertainment:0 Research Homework:1	

The assumptions of multiple linear regression analysis, including normal distribution, linearity, constant variance, absence of autocorrelation, and no multicollinearity among independent variables, were tested (Kalayci, 2009). The assumptions of normality and linearity were examined through graphs depicting the relationships between standardized predicted values and standardized residual values (Figure 1 and Figure 2). According to Figure 1, the histogram and normal distribution curves created for standardized predicted values show a distribution close to normal. According to Figure 2, a linear and positive relationship between variables can be suggested.

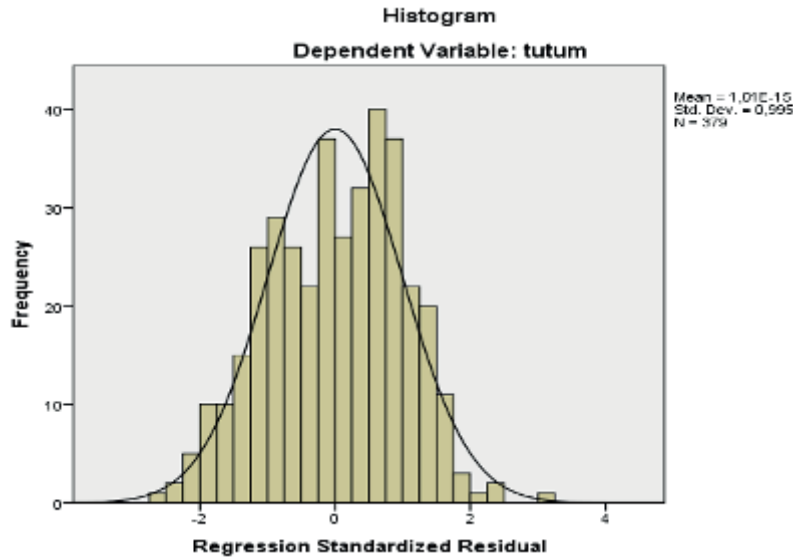


Figure 1. Histogram and Normality Curve of Attitude Data for Distance Education

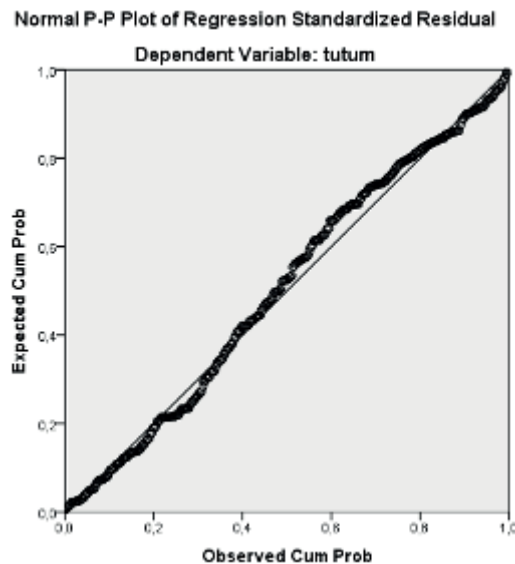


Figure 2. Linearity Distribution of Attitude Data for Distance Education

Upon examination of indicators of multicollinearity among predictor variables, tolerance values were found to range between 0.843 and 1.00, variance inflation factor (VIF) values ranged from 1.00 to 1.187, and the highest condition index (CI) value was found to be 21.546. According to Pallant (2016), to avoid multicollinearity issues in the analysis, the VIF value should be less than 10, and the tolerance value should be greater than 0.10. In this case, it can be concluded that there is no multicollinearity problem. The Durbin-Watson value, used to test autocorrelation, should be less than 1 or greater than 3, indicating the presence

of errors. A value close to 2 is preferable (Field, 2009, p. 236). In this study, the Durbin-Watson value of 2.015 indicates the absence of autocorrelation. The standardized residual value ranges from -2.566 to 3.07. Tabachnick and Fidell (2013) suggest that these values should be between +3.3 and -3.3. The maximum value for Cook's Distance is 0.031. A value below 1 indicates that the data is suitable for regression analysis (Tabachnick & Fidell, 2013).

RESULTS

The results of the multiple regression analysis, conducted using the stepwise model on data related to e-learning styles, which are considered as factors affecting attitude scores towards distance education, including gender, type of education preference, monthly internet package, and the variable of the most common purpose of internet use, are presented in Table 4 below. As can be seen in Table 4, stepwise regression analysis excluded variables that did not significantly predict attitudes towards distance education.

Table 4. Results of Stepwise Multiple Regression Analysis on Variables Predicting Attitudes Toward Distance Education

	Model-Predictive variables	B	Std. Error	Beta	t	Sig.	Partial (r)	Part (R)	R	R ²	F	p
Model 1	(Constant)	3.243	.056		58.182	.000						
	Preferred type of education	-.783	.061	-.552	-12.851	.000	-.552	-.552	.552	.305	165.148	.000
Model 2	(Constant)	3.363	.063		53.087	.000						
	Preferred type of education	-.767	.060	-.541	-12.773	.000	-.550	-.539	.575	.330	92.658	.000
	Gender	-.187	.049	-.160	-3.785	.000	-.192	-.160				
Model 3	(Constant)	3.808	.163		23.332	.000						
	Preferred type of education	-.769	.059	-.542	-12.929	.000	-.555	-.540	.588	.345	65.948	.000
	Gender	-.186	.049	-.159	-3.800	.000	-.193	-.159				
	Visual-auditory	-.115	.039	-.123	-2.953	.003	-.151	-.123				
Model 4	(Constant)	3.580	.179		19.983	.000						
	Preferred type of education	-.754	.059	-.531	-12.763	.000	-.551	-.528	.600	.360	52.663	.000
	Gender	-.191	.048	-.164	-3.952	.000	-.200	-.163				
	Visual-auditory	-.163	.042	-.175	-3.897	.000	-.198	-.161				
	Independent learning style	.105	.036	.133	2.954	.003	.151	.122				

As can be seen in Table 4, in the regression analysis, when the predicting variables are gradually introduced into the model, four models are formed. In the first model, the predicting variable is 'preferred type of education,' while in the second model, the variable 'gender' is added. In the third model, the visual-auditory learning style is introduced, and finally, in the fourth model, the independent learning style is added. Examination of the t-test results in the regression analysis suggests that all variables entering the equation are predictors of attitudes toward distance education. When binary and partial correlations are examined, the type of education ($r = -.55$) shows a moderate, while gender ($r = -.20$) and visual-auditory learning style ($r = -.20$) demonstrate a low and negative relationship with attitudes toward distance education. A low-level and positive relationship ($r = -.15$) is observed between independent learning style and attitudes toward distance education. When other variables are controlled, the relationships are observed to largely remain unchanged. Model 4 reveals that all four variables are significantly included according to their beta values. In order of importance (based on beta values), the preferred type of education ($\text{beta} = -.531$, $p < .01$) contributes the most,

followed by visual-auditory learning style ($\beta = -.175$, $p < .01$), being female ($\beta = -.164$, $p < .01$), and finally, independent learning style ($\beta = .133$, $p < .01$). In the final model, these four variables together account for 36% of the total variance in attitudes toward distance education, $F(4,374) = 52.663$, $p < .01$

DISCUSSION

According to the research findings, four variables have proven to be effective in predicting attitudes toward distance education. The preferred type of education, gender, visual-auditory learning style, and independent learning style predict attitudes toward distance education. In a series of studies, it has been emphasized that students' learning styles should be considered in distance education (Yinanc & Ozudogru, 2023) and that e-learning styles have a positive impact on student achievement and attitude (Kurnaz & Ergun, 2019; Tulbure, 2011). Furthermore, it has been suggested that a distance education program designed based on students' learning styles enhances student satisfaction and promotes success (Dille and Mezack, 1991), fosters more interaction among students, and increases learning motivation (Ekici, 2003). These findings indicate that considering individual differences in distance education can have a positive impact on student achievement and satisfaction.

According to the results obtained in the research, a moderate and negative relationship has been identified between students' preference for face-to-face education and their attitudes toward distance education. This situation indicates that students who prefer face-to-face education may have hesitation or a negative perception toward distance education. At the same time, the prediction of distance education by the preferred type of education suggests that students' educational preferences have an impact on distance education. Consistent with these findings in the literature, numerous studies are emphasizing that distance education may not be as effective as face-to-face education, and studies revealing negative attitudes and opinions toward distance education (Karatepe et al., 2020; Karakus, et al., 2020; Rizun & Strzelecki, 2020; Sutiah et al., 2020; Syaumi et al., 2020; Unger and Meiran, 2020). Adversities experienced in distance education can contribute to student dissatisfaction (Arbour, Kaspar & Teall, 2015; Devran & Elitas, 2016; Illarionova et al., 2021; Karakus, et al., 2020; Karakus & Yanpar-Yelken, 2020; Keskin & Ozer-Kaya, 2020; Runtic & Kavelj, 2020; Terzi, 2021; Yagan, 2021; Yildiz, 2016). These challenges may make face-to-face education more appealing and increase students' confidence in traditional teaching methods. Therefore, educational institutions producing solutions to address the challenges encountered in distance education can potentially redirect students' negative attitudes towards distance education in a positive direction. Additionally, the research emphasizes the advantageous aspects of distance education, such as providing time and space flexibility, ensuring equal opportunities, enabling ample review opportunities, facilitating access to more information, and reducing costs (Joosten and Cusatis, 2020; Harsasi, 2015; Ozgol, Sarikaya & Ozturk, 2017). These findings indicate that the alternative options offered by distance education should not be overlooked. Hybrid education can be used to overcome the disadvantages of distance education. Hybrid education provides students with both face-to-face interactive learning opportunities and the chance to benefit from the advantages of distance education (Linder, 2017). Courses that cannot be effectively delivered through distance education or have low efficiency can be supplemented with face-to-face education.

In the study, a negative and low-level relationship was found between the gender of teacher candidates and their attitudes toward distance education. Additionally, gender was identified as a predictor of attitudes toward distance education. The negative trend in the attitudes of female teacher candidates suggests the need to consider gender-based differences in distance education. Tufekci-Aslim & Saracoglu (2023), Park (1997), and Dunn et al. (1993) found gender differences favoring female students in their research. In this regard, it is important for educators and policymakers to develop supportive strategies for fostering a more positive attitude towards distance education, especially among female teacher candidates. In a recent study, Armstrong-Mensah et al. (2020) emphasized that gender statistically did not have a significant impact on students' views on distance education. The findings of other studies in the literature indicate that students' gender does not create a significant difference in their attitudes toward distance education (Al Salman et al., 2021; Akoglu, 2022; Altuntas-Yilmaz, 2020; Bicer & Duruhan, 2014; Coskun & Demirtas, 2014; Celik, 2017; Hasturk & Ozdemir, 2021; Irwanto, Cahyana & Ayuni, 2024; Isikli, 2017). Therefore, more comprehensive studies considering student profiles, cultural differences, educational levels, and other variables are needed at this point.

The study determined that there is a negative and low-level relationship between teacher candidates' adoption of visual-auditory learning style and their attitudes towards distance education. Additionally, the results indicate that the visual-auditory learning style is a predictor of attitudes towards distance education. These findings suggest that learning styles, particularly those based on visual-auditory preferences, can influence students' attitudes towards distance education. Other studies in the relevant literature also reveal variations in visual-auditory preferences (Akturk, 2014; Ates & Altun, 2008; Birdal, 2022; Bilasa, 2015; Carrier, 2009; Dobson, 2010; Saban & Arslahan, 2015; Urval et al., 2014).

Unlike other predictive variables, it was determined that there is a positive and low-level relationship between teacher candidates' possession of an independent learning style and their attitudes towards distance education. Additionally, the independent learning style was identified as a predictor of attitudes toward distance education. This positive relationship between teacher candidates' independent learning styles and their attitudes toward distance education may reflect a transition towards personalized learning in education. Various studies emphasize that students' positive attitudes toward distance education are positively related to independent learning styles (Alsan, 2009; Aydemir, Kocoglu & Karali, 2016; Dunn et al., 1990; Senturk & Cigerci, 2018). In this context, it can be claimed that students actively involved in distance education environments tend to manage their learning more effectively (White, 2005). Since attitudes may vary throughout the academic year, collecting data for a specific period may be insufficient. Therefore, new research on attitudes toward distance education is needed.

CONCLUSIONS, LIMITATIONS, AND FUTURE RESEARCH

The research results indicate that the preferred type of education, gender, visual-auditory learning style, and independent learning style predict attitudes toward distance education. The low-level relationship between e-learning styles and attitudes toward distance education may be attributed to instructional staff conducting only (PowerPoint) presentations in lessons, failure to ensure student participation, and the students being passive listeners. Additionally, the absence of other cognitive factors such as motivation and self-regulation that could be effective in learning through distance education might have influenced the results. Studies in which these factors are controlled can be recommended for future research. Furthermore, researchers could explore the impact of a distance education course prepared by e-learning styles on attitudes toward distance education. Another important factor to consider in future research is the rapid advancement of educational technologies and the development of new instructional materials. These factors can significantly impact the experience of distance education. Therefore, a more detailed examination of students' adaptation processes to technology, and the use of different learning platforms and their interaction features can assist in determining more effective strategies in the design of future distance education practices.

While the majority of participants in the study were female students, the proportion of male students was relatively low. Additionally, the use of a convenient sample in this research prevents the generalization of the results (Emerson, 2021). This situation indicates that the findings are based on a specific sample and therefore cannot be generalized. In future studies, using a larger and more diverse sample, conducting research designed to include participants from different age groups, socioeconomic levels, and geographical regions can enhance the generalizability of the findings. Despite these limitations, our study provides a valuable contribution to understanding how students' e-learning styles and attitudes toward distance education may vary based on different demographic factors. In conclusion, while shedding light on recommendations for future research, these limitations prompt a careful evaluation of the findings and interpretations of the current study.

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