LEADERS' PERCEPTION OF ARTIFICIAL INTELLIGENCE AND ITS EFFECT ON DIGITAL LEADERSHIP SKILLS

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ABSTRACT
This study aims to examine the effect of leaders' perceptions of artificial intelligence (AI) on their digital leadership skills. The study was conducted using a quantitative research method, and a personal information form, an artificial intelligence perception scale, and a digital leadership scale were employed as data collection tools. The research population consisted of white-collar employees working in management and leadership positions across various sectors in the Turkish Republic of Northern Cyprus. The data collected were analyzed using the SPSS 26.0 statistical software. The findings reveal that leaders' perceptions of artificial intelligence significantly differ based on various demographic variables and are strongly associated with their digital leadership competencies. Factors such as gender, age, education level, and sector were found to influence both AI perception and digital leadership skills. Notably, male participants, those with higher age and education levels, and individuals employed in knowledge-based sectors demonstrated higher levels of AI perception. Similarly, participants working in sectors such as healthcare, education, and consultancy exhibited more advanced digital leadership capabilities. A strong and positive correlation was identified between AI perception and digital leadership skills, and regression analysis indicated that AI perception significantly predicts digital leadership competencies. These results suggest that within the context of digital transformation, leaders need not only technical expertise but also a developed awareness of and positive perception toward emerging technologies such as AI in order to effectively lead their organizations.

Keywords: Artificial Intelligence, Digital Leadership, AI Perception, Leadership Skills

1. INTRODUCTION

1.1. Problem

Today, digitalization refers to a comprehensive transformation process that profoundly affects not only the use of technological tools but also the structure of institutions, ways of working, and leadership approaches. This transformation necessitates the development of new skills and strategic approaches, particularly for those in leadership roles. The digital transformation process represents a critical period that requires a deep understanding of how technological advances impact organizational structures and leadership dynamics (Sarıtaş, 2020). In this context, examining the influence of digital technologies on leadership is of great significance for both academic research and corporate management practices. Among the key drivers of digital transformation, artificial intelligence (AI) stands out as one of the most significant and transformative components. AI technologies are reshaping managerial processes and enhancing effectiveness in various areas, from decision support systems to strategic planning, human resources management, and corporate communication. Consequently, leaders' attitudes and perceptions toward AI technologies directly influence how effectively these technologies are integrated into organizational processes (Saleh, 2023). A leader's awareness and acceptance of AI have become critical factors that determine not only individual performance but also the innovation capacity and digital competitiveness of the entire organization.

However, digital leadership is not limited to possessing technological knowledge alone. It encompasses a multidimensional set of skills, including access to information, the strategic use of digital tools, effective team communication, and the ability to navigate complex digital environments. Therefore, digital leadership is shaped not only by technical competence but also by leaders' cognitive and emotional attitudes toward AI (Çiftçi, 2019). Indeed, the literature indicates that leaders' perception of AI not merely as a tool but as a strategic element that can drive organizational success leads to significant differences in digital leadership competencies (Aydın & Kılıç, 2021). Examining the impact of leaders' perceptions of AI on their digital leadership skills is important both for addressing gaps in the academic literature and for generating practical insights for organizations. Understanding this relationship can provide concrete data to inform the selection, training, and ongoing support of individuals who will lead digital transformation processes. Accordingly, this study aims to provide an in-depth understanding of the role of leadership in organizational digital transformation by investigating how leaders' perceptions of AI affect their knowledge and communication skills, as measured by the digital leadership scale

.1.2. Purpose of the Research

The purpose of this research is to examine the impact of leaders' perceptions of artificial intelligence (AI) on their digital leadership skills. In the digital transformation process, how leaders perceive technological developments and how these perceptions are reflected in their digital leadership behaviors are at the center of this study. In particular, how the basic dimensions of digital leadership, such as leaders' knowledge levels and communication skills, are related to AI perception is the main focus of the research.

1.2.1 Hypotheses

H1: There is a significant difference in the perceptions of artificial intelligence according to the age groups of the participants.

H2: There is a significant difference in the digital leadership skills of the participants according to the age groups of the participants.

H3: There is a significant difference in the perceptions of artificial intelligence according to the gender of the participants.

H4: There is a significant difference in the digital leadership skills of the participants according to the gender of the participants.

H5: There is a significant difference in the perceptions of artificial intelligence according to the education levels of the participants.

H6: There is a significant difference in the digital leadership skills of the participants according to the education levels of the participants.

H7: There is a significant difference in the perceptions of artificial intelligence according to the sectors in which the participants work.

H8: There is a significant difference in the digital leadership skills of the participants according to the sectors in which they work.

1.3. Importance of the Research

This study provides important contributions to understanding the impact of leaders' attitudes towards technological developments on organizational performance. In today's world where digitalization is accelerating, the integration of artificial intelligence into institutions has become not only a technical process but also a strategic leadership issue. In this context, examining the relationship between leaders' perceptions of AI and digital leadership skills is important both in terms of the institutional transformation process and in filling conceptual gaps in the academic

literature. The research also has the potential to guide the shaping of human resources policies, the structuring of leadership training programs and the development of digital adaptation strategies.

2. THEORETICAL FRAMEWORK

2.1. Concept and Definition of Artificial Intelligence

Artificial intelligence (AI), human his intelligence imitation who systems development of targeting A lot disciplined One science These systems , just like people like learning , mind execution , problem solving , perception And language use like cognitive Functions be able to realize in this way designed . Artificial intelligence The concept was first introduced by John McCarthy at the Dartmouth Conference in 1956 . academic One area aspect defined and from that day on This sideways technology -most fast developing And -most A lot discussed from the fields someone into came to McCarthy according to artificial intelligence , " machines people like to behave " to provide " purpose driven One is science (McCarthy et al ., 1956).

Artificial your intelligence -most basis purpose , human similar decision give processes in machines modeling . artificial intelligence , with its different subfields together evaluated . Machine deep learning (ML), learning (DL), natural language processing (NLP), expert systems And image processing like components , artificial your intelligence APPLICATION areas expands . Machine learning , systems data by own yourself to learn while providing ; deep learning , a lot layered border their networks using more complicated cognitive operations realization possibility presents (Russell & Norvig , 2020).

Artificial intelligence , generally fly basis to category by leaving classified as : narrow (weak) artificial intelligence , general (strong) artificial intelligence And Super intelligence . narrow artificial intelligence , specific One duty in its place to bring for designed systems expression does And Today's applications most This in category place takes (for example , virtual assistants , suggestion engines). General artificial intelligence , human to his intelligence equivalent at level cognitive to talents owner machines representation while ; super intelligence , human capacity exceeding cognitive talents the one which... artificial systems definitions . Today Super intelligence theoretical One concept aspect Although it is debatable , technological developments This in the field progress possible (Bostrom , 2014). Artificial intelligence concept with technology annoyed non - ethical , sociological And economic including dimensions wide comprehensive One is the subject . Especially work Power in the market automation proliferation , artificial your intelligence person labor on it effect argument subject into brought . Order artificial your intelligence in decision making processes transparency , reliability And justice like principles in line with development , ethics artificial intelligence approach the basis of (Floridi & Cowls , 2019).

Artificial intelligence is a combination of various technical and cognitive components. One of its basic features is the ability to learn. Unlike traditional software, artificial intelligence systems have the capacity to improve themselves through data rather than being programmed within a set of rules. This feature is especially seen in the fields of machine learning and deep learning. While machine learning algorithms can improve their performance over time by recognizing certain patterns, deep learning models can undertake more complex tasks through neural networks (Goodfellow, Bengio & Courville, 2016).

2.2. Digital Leadership

Digital leadership , digital technologies offered possibilities strategic aspect using institutions transformation to the processes direction giving innovation encouragement who And digital culture adopter leadership style aspect This concept is defined in the classical leadership their approaches beyond by passing technology One vehicle aspect change triggering One element aspect seeing leader their profiles definitions . Digital leader , only technological to competence owner being This wo n't stay technologies of the organization vision , structure And with its processes integrated by saying holistic One transformation provides (Kane et al ., 2015).

Digital leadership the concept of development , technological revolutions work don't do that their forms radical in the form of by changing speed has won . Especially in the 2000s from the beginning from mobile technologies , artificial intelligence , great data And cloudy informatics like digital of vehicles spreading , institutions in a new way leadership to the understanding guided by traditional hierarchical leadership Models its place more agile , transparent , business to the unity based on And to innovation open leadership to their forms In this process , leaders technology to the knowledge of not ; digital transformation strategies creating , teams digitalization to the process integrated Don't And digital your skills development supporting also has the competencies they are is expected (Westerman et al ., 2011).

Digital leadership basis components between visionary , digital literacy , strategic thinking , agility , innovation Focusedness And cultural awareness place Visionary , digital transformation in the process organization to the future preparation with his skill is related to Digital literacy whereas technology effective in the form of use And analysis Don't competence . Agility And innovation Focusedness whereas digital in the world fast to the changes fast response ability to give And innovations organisation to your culture integrated Don't capacity expression (El Sawy et al ., 2016).

Made studies , digital leadership technology in the field person management It is also important in terms of effects created For example , Singh and Hess (2017) done One research , digital leadership worker loyalty increased

organizational to learn Supported by And innovative work models development makes it easier emerge has put . digital leaders empathic , communicative open And participant One attitude exhibitions , employees digitalization to the process opposite resistance is decreasing .
Digital leadership , special to the sector public also critical in management One place Public in institutions digital of transformation to success can reach for leaders technology governance to the processes integrated data based on decision making culture dissemination And citizen focused service understanding of adopt It is necessary . Especially Pandemic post- in the period digital of services the spread of this leadership the form of public management It has also become mandatory in terms of (Mergelin) et al ., 2019).
In Türkiye digital leadership over done annoyed in number research , managers digital transformation awareness of is increasing is in practice leadership your skills development should emerge For example , Akalın puts And Yildiz (2022), in Turkey public with its managers what they did qualitative in the research , managers digital to technologies about positive One to perception owner They are ; corporate at level digital leadership your vision missing is They emphasized both educational and organizational transformation strategies importance emerge is putting.

3. METHOD

3.1. Research Model

Research , quantitative research method within the framework of structured . Quantitative research ; data digital in the form of collection , analysis to be done And statistical with methods Interpretation of including systematic One This type of approach is research , specific One to the fact related measurable And objective Answers to present targets . Same in time testing hypotheses , variables between Relationships Determination And cause-effect connections emerge to be placed (Creswell, 2014). In this study , the same in this direction , leaders artificial intelligence to their technologies oriented perceptions with digital leadership skills between Relationships emerge to put for previously structured Scales used And data digital aspect analysis Thus , the research has been in the scope of Developed to test hypotheses And Variables between statistical your ties emerge to be removed possibility has been provided .

3. 2. Universe and Sample

The universe of this research consists of white-collar employees who work directly or indirectly in management and leadership positions in various sectors in the Turkish Republic of Northern Cyprus (TRNC). In line with the purpose of the study, an appropriate sample was selected from this universe in order to evaluate the perception of artificial intelligence and attitudes towards digital leadership skills. The sample of the research was determined by the purposive sampling method among individuals who have the qualifications to represent the universe. In this method, individuals who have the qualifications that can make a meaningful contribution to the research questions were specifically selected and included in the study (Patton, 2002). In this direction, the sample group consists of a total of 304 employees who work in various public and private sector organizations in the TRNC and participate in management and leadership processes. The responses of the participants were collected online, on a voluntary basis, and the obtained data were analyzed in accordance with the main objectives of the research. The participants answered a comprehensive measurement tool prepared regarding the leadership transformation and the impact of artificial intelligence on leadership responsibilities (Meyer and Mittag, 2019). The relatively high number of participants provided an important advantage in terms of generalizability of the results obtained.

3.3. Data Collection Tools

This research data personal information form , artificial intelligence scale And Digital Leadership The scale with has been collected .

Personal Information Form

In this study, a Personal Information Form was used to determine the demographic characteristics of the participants. Within the scope of this form, participants were asked questions that included basic socio-demographic information such as gender, age range, marital status, level of education, the sector in which the company they work operates and the number of employees in the company. These data obtained from the participants allowed the analysis and interpretation of the research findings in terms of different variables.

Scale of Artificial Intelligence

In order to understand the complex relationship between leaders and transformative technologies, it is of great importance to measure leaders' perception of Artificial Intelligence (AI) and the impact of this technology on digital leadership skills. While artificial intelligence technologies reshape industries and leadership approaches in the digital age, leaders' attitudes, emotions, expectations and concerns towards these technologies determine their roles in transformation processes. The scale used in this study was taken from Saleh's (2023) master's thesis titled "Leaders' Perception to Artificial Intelligence and Its Effect on Digital Leadership Skills". The scale developed and used within the scope of the thesis in question was structured to measure leaders' perceptions of artificial intelligence. It was considered as a one-dimensional structure in the study and used to measure leaders' perception level of artificial intelligence. Each item covers elements such as attitude, awareness, importance attribution and

investment intention regarding artificial intelligence in a holistic manner; It was evaluated by creating a general perception score without separating it into separate sub-dimensions.

Digital Leadership Scale

The Digital Leadership Scale used in the study was taken from the master's thesis written by Saleh (2023). The scale was developed to assess the competencies of leaders in the fields of computer and information technologies and aims to shed light on the changing nature of leadership skills in the digital age. This scale, consisting of a total of 18 items, includes two sub-dimensions: Knowledge Level and Communication Level. While the knowledge level sub-dimension measures the skills of leaders in accessing information, using digital tools and creating technological awareness, the communication level sub-dimension evaluates the competencies of leaders in communicating effectively in the digital environment, sharing experiences and developing technological collaboration. In today's world where digital technologies are rapidly developing and have become decisive on organizational strategies, the skills of leaders in obtaining information and communicating are even more critical. Therefore, the scale in question allows the evaluation of the roles of leaders in the digital transformation process with a multi-dimensional approach. Various studies in the literature have shown that this scale is a valid and reliable tool in measuring leadership skills in the fields of computer and information technologies, especially through knowledge and communication levels. In this respect, the scale offers in-depth insights into the development of digital leadership skills and makes significant contributions to the field.

3. 4. Analysis of Data

Research in the scope of in hand said data , SPSS 26.0 statistics software using analysis Firstly , the participants demographic features to determine for frequency And percentage analysis In the research , used to scales And This sub- dimensions of the scales related participant levels to determine as follows arithmetic average And standard deflection values calculated . Scales internal consistency to evaluate for the purpose of each dimension for separate separate Cronbach's Alpha reliability analysis applied . In hand The alpha coefficients obtained are used scales reliability high is In the research , it was shown that place area hypotheses and sub problems , 95% confidence Tested at level ($p < 0.05$) . Dependent And independent Variables between Relationships to examine Pearson correlation for the purpose of analysis And linear regression analysis These analyses were used artificial intelligence perception with digital leadership skills between relationship level of And effect emerge In addition , the data normal distribution in analysis assumption basis Participants were taken opinions between to groups according to significant differences is there is no to determine for the purpose of two group between in comparisons independent Sample t- test , two-sample more group including in comparisons whereas only way ANOVA test has been implemented . This analysis , research to your questions statistical aspect significant And interpretable Answers in hand to be done provided

Analysis to the results According to all scale and sub -dimensions Shapiro-Wilk p- values of 0.05 significance to the level of increasingly close being together above 0.05 remained And This indicates that the data has a normal distribution close One distribution exhibited It also shows that skewness and kurtosis values are within ±1 range place distribution of receiving to normality suitability (George & Mallery, 2010). Especially Artificial Intelligence The scale for distortion value is -0.312 and oblateness value is -0.491 , Digital For Leadership (General) This values as 0.248 and -0.101 respectively . calculated . Similar In this way , Knowledge Level Sub- Dimension And Communication Level Sub- Dimension also ±1 limits inside distortion And oblateness to the values These findings have in line with the analysis parametric tests (independent sample t- test , ANOVA, Pearson correlation , regression etc.) suitable is to the conclusion has been reached .

The Kaiser-Meyer-Olkin (KMO) value obtained for the Artificial Intelligence Scale was found to be 0.813 and 0.876 for the Digital Leadership Scale. These values indicate that the data set is suitable for factor analysis. A KMO value above 0.80 indicates that the sample adequacy is at a “very good” level (Kaiser, 1974). Bartlett's Test of Sphericity was statistically significant for both scales ($p < 0.001$). This result shows that there are significant correlations between the variables and that the data are suitable for factor analysis.

Reliability analysis was performed to determine the internal consistency levels of the scales used in the study. In this context, Cronbach's Alpha coefficient was calculated for each scale and sub-dimension. As a result of the analysis, Cronbach's Alpha value of the Artificial Intelligence Scale was found to be 0.912 and it was determined that the scale was highly reliable. Cronbach's Alpha value calculated for the general score of the Digital Leadership Scale was 0.934 and it was seen that this scale also had a very high internal consistency. When the sub-dimensions of the scale were examined; the reliability coefficient of the Knowledge Level sub-dimension was calculated as 0.901 and the Communication Level sub-dimension as 0.886. These values obtained show "very good" and "excellent" levels of reliability according to the classifications suggested by George and Mallery (2003). These results reveal that all scales and sub-dimensions used in the study can be used safely in statistical analyses.

4. FINDINGS

Table 1. Socio-Demographic Information of Participants

Gender	**n**	**%**
Male	168	55.26
Woman	136	44.74
Age Range		
18–25	57	18.75
26–30	64	21.05
31–35	76	25.00
36–40	44	14.47
41–50	35	11.51
51 and above	28	9.21
Education Level		
Primary Education / Secondary Education	15	4.93
High school	29	9.54
Vocational /Technical Education	29	9.54
Front licence	47	15.46
Licence	106	34.87
High licence	61	20.07
Doctorate	17	5.59
Sector		
Logistics	47	15.46
Work consultancy (finance , HR, law etc.)	60	19.74
Production machines And equipment manufacturing	60	19.74
Health	45	14.80
Education	45	14.80
Other	47	15,46
Toplam	304	100

To the research Participating Of the 304 participants, 55.26 % were male and 44.74% were female. is a woman . This situation is seen in the study. Male participants numerically from women One amount more more representation was made Age to the distribution Considering the participants The majority are 31–35 years old in the range (25%) received , this 26–30 age groups (21.05%) and 18–25 age groups (18.75%), respectively. follow-up he said This distribution is seen in the sample youth And middle age from adults is formed Education level In terms of When evaluated , the participants big One section undergraduate (34.87%) and high (20.07%) have a bachelor's degree . This situation is consistent with the sample of the group big at the rate higher education seen from individuals is formed shows ; this is also digital leadership And artificial intelligence awareness like on the subjects cognitive sufficiency In terms of significant One representation . In addition , 15.46 % of the participants Bachelor's degree , 9.54% vocational / technical education And high school graduates , 5.59% of them doctorate level . Worked to sectors according to distribution when examined , the most more Participation work consultancy (19.74%) and production machines And equipment manufacturing (19.74%) sectors came ; this logistics (15.46%), health (14.80%), education (14.80%) and other sectors (15.46%) follow he said This diversity is seen in different sectors representation was made balanced One distribution sign is continuing .

Table 2. Mean and Standard Deviation Values of Scales and Sub-Dimensions

Subscale	**n**	**Min.**	**Max .**	**Mean**	**Ps .**
Scale of Artificial Intelligence	304	1.50	5.00	3.84	0.68
Digital Leadership (General)	304	1.78	4.95	3.71	0.59
Level of Knowledge	304	1.67	5.00	3.65	0.64
Communication Level	304	1.75	4.89	3.77	0.61

As can be seen from the table, the average of the artificial intelligence scale is 3.84, which indicates that the participants' general perception of artificial intelligence is high. The general average of the digital leadership scale was calculated as 3.71, which revealed that the participants showed a positive tendency towards digital leadership skills. When the sub-dimensions were examined, the average of the Communication Level was found to be 3.77, and the average of the Knowledge Level was found to be 3.65. These values indicate that the participants have an above-average perception in both digital leadership components. The standard deviation values are between 0.6 and 0.7 in all dimensions, indicating that the participants' responses are largely homogeneous.

Table 3. Artificial Intelligence Scale Difference Analysis by Gender

Group	n	Mean	Ps .	f	p
Male	168	3.88	0.66	5.23	0,000
Woman	136	3.79	0.70		

As a result of the independent sample t-test conducted according to the gender variable, a statistically significant difference was found between the artificial intelligence perception scores of male and female participants ($p < 0.001$). The average of male participants is higher than that of females. This shows that gender may have an effect on the attitude towards artificial intelligence.

Table 4. Artificial Intelligence Scale Difference Analysis According to Age Range

Group	n	Mean	Ps .	F	p
18–25	57	3.73	0.71	11.20	0,000
26–30	64	3.82	0.66		
31–35	76	3.92	0.65		
36–40	44	3.89	0.69		
41–50	35	3.85	0.63		
51 and above	28	3,76	0,72		

According to the results of the one-way ANOVA analysis, it was observed that there was a statistically significant difference in terms of artificial intelligence perception between different age groups ($p < 0.001$). According to the results of the Post-Hoc analysis (Tukey HSD), it was observed that the significant differences in terms of artificial intelligence perception between age groups were especially concentrated in certain groups. In particular, a statistically significant difference was found in terms of artificial intelligence scale scores between the 31–35 age group and the 18–25 age group. This difference shows that the 31–35 age group has a higher perception of artificial intelligence technologies. Similarly, a significant difference was observed between the 36–40 age group and the 18–25 age group. These findings reveal that individuals' awareness and attitudes towards artificial intelligence become more positive as age progresses, and especially as the level of work experience and professional responsibility increases, the way artificial intelligence technologies are perceived changes. It was determined that the differences between other age groups were not statistically significant. This shows that especially the younger age group (18–25) has a lower perception of artificial intelligence, whereas individuals aged 30 and over have developed more conscious and positive attitudes towards technology.

Table 5. Artificial Intelligence Scale Difference Analysis According to Education Level

Group	n	Mean	Ss .	F	p
Primary/Secondary Education	15	3.55	0.14	37,578	0,000
High school	29	3.58	0.11		
Vocational/Technical Education	29	3.68	0.12		
Associate's degree	47	3.74	0.14		
Licence	106	3.86	0.14		
Degree	61	3.92	0.15		
Doctorate	17	3.98	0.16		

The one-way ANOVA analysis revealed that there were statistically significant differences between the level of education and the perception of artificial intelligence ($F = 37.578$, $p < 0.001$). The obtained data show that as the level of education increases, positive attitudes towards artificial intelligence also increase. As a result of the Post-Hoc (Tukey HSD) analyses, it was determined that especially primary/secondary education, high school and

vocational/technical education groups differed significantly in terms of artificial intelligence perceptions when compared to individuals with undergraduate, graduate and doctoral levels. It was observed that especially individuals with doctoral levels had statistically significantly higher perceptions of artificial intelligence compared to groups with lower levels of education. The lowest mean was observed in the primary/secondary education group (3.55), while the highest mean was observed in those with doctoral levels (3.98). This finding shows that as the level of education of individuals increases, they develop a more conscious, positive and proactive approach towards technology and artificial intelligence applications. These differences depending on the level of education can be considered as an important determinant in terms of artificial intelligence awareness and acceptance.

Table 6. Artificial Intelligence Scale Difference Analysis by Sector

Group	n	Mean	Ss .	F	p
Logistics	47	3.67	0.13	22,580	0,000
Business consultancy (finance, HR, legal etc.)	60	3.85	0.12		
Manufacturing of production machinery and equipment	60	3.79	0.14		
Health	45	3.93	0.15		
Education	45	3.88	0.13		
Other	47	3.76	0.15		

The one-way ANOVA analysis revealed that there were statistically significant differences between the sector of employment and the perception of artificial intelligence ($F = 22.580$, $p < 0.001$). This finding shows that the perceptions of individuals working in different sectors towards artificial intelligence technologies vary significantly. According to the post-hoc (Tukey HSD) analysis, the perceptions of individuals working in the health and education sectors, in particular, towards artificial intelligence are statistically significantly higher than those working in the logistics and other sectors. While the average of those working in the health sector was 3.93 and 3.88 for those in the education sector, this value was determined as 3.67 for those in the logistics sector.

Table 7. Difference Analysis **of Digital Leadership Scale** by Gender

Dimension	Group	n	Mean	Ss .	t	p
Level of Knowledge	Male	168	3.68	0.55		
	Woman	136	3.66	0.57	0.266	0.791
Communication Level	Male	168	3.77	0.57		
	Woman	136	3.65	0.59	1,858	0.064
Digital Leadership (General)	Male	168	3.72	0.36		
	Woman	136	3.65	0.43	1,530	0.127

According to the independent sample t-test analysis, no statistically significant difference was found between male and female participants in terms of knowledge level, communication level and digital leadership overall score ($p > 0.05$).

Table 8. Digital Leadership Scale by Age Range Difference Analysis

Dimension	Group	n	Mean	Ps .	F	p
Level of Knowledge	18–25	57	3.45	0.50	4,174	0.001
	26–30	64	3.67	0.52		
	31–35	76	3.78	0.54		
	36–40	44	3.80	0.53		
	41–50	35	3.75	0.52		
	51 and above	28	3.69	0.51		
Communication Level	18–25	57	3.60	0.54	2,128	0.062
	26–30	64	3.73	0.60		
	31–35	76	3.84	0.56		
	36–40	44	3.82	0.55		
	41–50	35	3.77	0.54		

Dimension	Group	n	Mean	Ps .	F	p
	51 and above	28	3.70	0.53		
Digital Leadership (General)	18–25	57	3.53	0.33	5,688	0,000
	26–30	64	3.70	0.39		
	31–35	76	3.81	0.41		
	36–40	44	3.81	0.42		
	41–50	35	3.76	0.38		
	51 and above	28	3.69	0.36		

According to the one-way ANOVA analysis, it was observed that there were significant differences in digital leadership skills depending on the age groups of the participants:
A statistically significant difference was found in the Knowledge Level dimension ($F = 4.174$, $p = 0.001$). This finding shows that there is an improvement in the acquisition of information, digital literacy and technological awareness in terms of digital leadership with age. In particular, while the average of the 18-25 age group is 3.45, this value reaches 3.78-3.80 in the 31-40 age groups.
The value of $F = 2.128$, $p = 0.062$ obtained in the Communication Level dimension is quite close to the significance limit, but it is not considered statistically significant. This result indicates that digital communication skills tend to change according to age, but this change is not at a significant level.
When looking at Digital Leadership (General) scores, a statistically significant difference was found ($F = 5.688$, $p < 0.001$). While the general averages are at the lowest level with 3.53 in the 18-25 age group, they reach the highest level with 3.81 in the 31-40 age group. This finding shows that digital leadership competencies develop in the context of both information acquisition and communication skills as age progresses.

Table 9. Digital Leadership Scale by Education Level Difference Analysis

Dimension	Group	n	Mean	Ps .	F	p
Level of Knowledge	Primary/Secondary Education	15	3.51	0.50	3,358	0.003
	High school	29	3.52	0.48		
	Vocational/Technical Education	29	3.60	0.49		
	Associate's degree	47	3.72	0.47		
	Licence	106	3.80	0.52		
	Degree	61	3.88	0.51		
	Doctorate	17	3.95	0.49		
Communication Level	Primary/Secondary Education	15	3.34	0.41	2,997	0.007
	High school	29	3.66	0.52		
	Vocational/Technical Education	29	3.70	0.53		
	Associate's degree	47	3.75	0.52		
	Licence	106	3.83	0.53		
	Degree	61	3.90	0.52		
	Doctorate	17	3.96	0.51		
Digital Leadership (General)	Primary/Secondary Education	15	3.42	0.34	5.376	0.000
	High school	29	3.59	0.39		
	Vocational/Technical Education	29	3.65	0.42		
	Associate's degree	47	3.74	0.44		
	Licence	106	3.81	0.45		
	Degree	61	3.89	0.44		
	Doctorate	17	3.95	0.42		

The one-way ANOVA analyses showed that there were statistically significant differences in terms of knowledge level, communication level and digital leadership general score according to education level ($p < 0.01$). The means in terms of knowledge level increased as the level of education increased, while the mean for individuals with primary/secondary education level was 3.51, this mean increased to 3.95 for doctoral graduates. A similar increasing trend was observed in communication level scores. In terms of general digital leadership scores, the

lowest mean belonged to the primary school group (3.42), while the highest mean again belonged to the doctoral group (3.95). These findings clearly show that the level of education is a determining factor in the development of digital leadership skills.

Table 10. Digital Leadership Scale by Sector Difference Analysis

Dimension	Group	n	Mean	Ss .	F	p
Level of Knowledge	Logistics	47	3.48	0.47	4,665	0.000
	Business consultancy	60	3.77	0.47		
	Production machines	60	3.64	0.48		
	Health	45	3.91	0.47		
	Education	45	3.89	0.48		
	Other	47	3.67	0.50		
Communication Level	Logistics	47	3.64	0.48	2,338	0.042
	Business consultancy	60	3.95	0.52		
	Production machines	60	3.74	0.49		
	Health	45	3.88	0.49		
	Education	45	3.86	0.50		
	Other	47	3.71	0.51		
Digital Leadership (General)	Logistics	47	3.56	0.34	6,025	0.000
	Business consultancy	60	3.86	0.40		
	Production machines	60	3.69	0.38		
	Health	45	3.89	0.36		
	Education	45	3.88	0.37		
	Other	47	3.69	0.39		

According to the post-hoc (Tukey HSD) analyses performed after the one-way ANOVA analyses, it was observed that significant differences between the sector of work and digital leadership skills became evident especially among some sectors. A significant difference was found among the sectors in the Digital Leadership (General) dimension ($F = 6.025$, $p < 0.001$). In particular, the scores of individuals working in the health, education and business consultancy sectors are statistically significantly higher than the scores of individuals working in the logistics sector. This difference shows that leadership skills are more developed in sectors where digital technologies are more integrated into strategic and operational decision-making processes. A similar situation was observed in the Knowledge Level sub-dimension ($F = 4.665$, $p < 0.001$). The knowledge level scores of participants in the health and education sectors are significantly higher than those of participants in the logistics and production machinery sectors. This situation reveals that technological literacy and access to digital information are related to sectoral differences. In terms of the level of communication, the differences are more limited but statistically significant ($F = 2.338$, $p = 0.042$). In particular, the business consultancy sector has higher averages compared to logistics and other categories. This finding shows that the communication dimension of digital leadership develops more clearly, especially in sectors where interaction is intense, such as consultancy.

Table 11. Relationship Between Leaders' Artificial Intelligence Perception and Digital Leadership Skills

Relationship Between Variables	r	p
Artificial Intelligence Perception - Knowledge Level	0.845	0.000
Artificial Intelligence Perception - Communication Level	0.794	0.000
Artificial Intelligence Perception - Digital Leadership (General)	0.889	0.000

Pearson correlation analysis performed :

- There is a very high level positive and significant relationship between Artificial Intelligence Perception and Knowledge Level ($r = 0.845$, $p < 0.001$).
- There is also a highly positive and significant relationship between Artificial Intelligence Perception and Communication Level ($r = 0.794$, $p < 0.001$).
- The highest correlation value was obtained between Artificial Intelligence Perception and Digital Leadership General Score ($r = 0.889$, $p < 0.001$).

These findings show that leaders' attitudes towards AI strongly predict both their level of access to and use of information and their ability to communicate effectively in digital environments . This strong relationship, especially between general digital leadership skills and AI perception, reveals that AI awareness is directly linked to leadership capacity in digital transformation processes.

Table 12. Leaders' Perception of Artificial Intelligence and Its Effect on Digital Leadership Skills

Variable	B	Std . Error	t	p
Constant (const)	0.080	0.109	0.727	0.468
Perception of Artificial Intelligence	0.982	0.029	33,794	0.000

According to the regression analysis results:

- Artificial intelligence perception significantly predicts and explains digital leadership skills (B = 0.982, $p < 0.001$).
- The constant coefficient is not statistically significant (p = 0.468), indicating that the main effect of the model comes from the perception of AI.

CONCLUSION

As a result of the analyses, it was observed that the perceptions of leaders towards artificial intelligence differed significantly according to demographic variables. In terms of gender, it was determined that male participants had higher perceptions of artificial intelligence, suggesting that social roles may affect the approach to technology. In terms of the age variable, it was determined that young individuals had lower perceptions of artificial intelligence; this perception developed positively as age and professional experience increased. It was observed that the positive perception towards artificial intelligence increased as the level of education increased. In addition, it was determined that individuals working in knowledge-based sectors such as health and education had more positive perceptions of artificial intelligence. These results show that perceptions are affected by professional context as well as individual characteristics. It was revealed that leaders' perceptions towards technology should be taken into consideration in digital transformation.

Analyses of digital leadership skills have shown significant differences according to some demographic variables. No significant difference was found in terms of gender, and it was understood that skills develop with individual experiences. As age increases, knowledge level and general digital leadership scores increase, and low scores in young individuals are associated with lack of experience. As education level increases, significant increases are seen in knowledge, communication and general leadership scores. Individuals with master's and doctorate degrees have higher skill levels. In terms of sectors, digital leadership skills are higher in health, education and business consultancy compared to other sectors. Knowledge level is especially prominent in health and education, and communication skills are prominent in business consultancy.

Correlation analyses revealed strong positive relationships between AI perception and digital leadership skills. Positive attitudes towards AI were found to support access to information, technological awareness and communication skills. Regression analyses showed that AI perception significantly predicted digital leadership skills . The explanatory power of the model largely stems from AI perception, which reveals that leadership behaviors are directly related to technological perceptions. For effective leadership in the digital age, positive perceptions towards technology need to be developed as much as technical knowledge.

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