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To cite this article:

Pourmousa, H., Oktay, E., Ozen, U., & Alipour, N. (2025). The impact of technology usage on education: A quantitative analysis among university students. *International Journal of Technology in Education (IJTE)*, 8(4), 1146-1160. <https://doi.org/10.46328/ijte.1246>

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The Impact of Technology Usage on Education: A Quantitative Analysis among University Students

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Article Info

Article History

Received:

3 February 2025

Accepted:

11 August 2025

Keywords

Technology

Education

Ordered logistic regression

Ordered probit regression

Abstract

Technology has revolutionized education by completely changing the processes of acquiring and sharing information, which are the most important foundations of education. Technology has led to many significant changes, such as increased access and scope, personalized learning, improved interaction and collaboration, diversification of learning methods, and flexibility and mobility. This research aims to investigate university students' technology use habits in education and to determine the factors affecting these habits. The aim of this study is to determine the factors affecting the use of technology in education among university students. In this context, data was obtained through a survey consisting of 65 questions. Data obtained through a quantitative and cross-sectional study involving 1008 university students selected by convenience sampling method were analyzed with ordinal logistic regression and probit regression models. In this study, many factors affecting students' technology use habits in education were examined. For instance, social activities such as spending time with friends and participating in cultural and arts events affect the use of technology in education. The study also examined the positive and negative effects of technology use in education on academic success. In this context, it was determined that the use of online course materials and resources and interactive applications are a factor in the use of technology in education. In the study, it was observed that ordered logistic regression and ordered probit regression models produced similar results, but it was determined that the ordered probit regression model had lower AIC and BIC values.

Introduction

In the 21st century, the dizzying advancement of technology has profoundly transformed most sectors (Birajdar et al., 2020; Deve and Dubey, 2023). Education, which plays a critical role in the development of societies by contributing to the development of individuals in a nation (Rabani et al., 2023), has been deeply affected by the rapid evolution of technology. The integration of technological tools into educational practices and causing significant reforms has not only reshaped traditional teaching and learning methods but also redefined the roles of educators and students, making tasks easier and faster. (Huffman, Whetten, & Huffman, 2013; Raja & Nagasubramani, 2018). Education has undergone a major evolution with technological change and the relentless

advancement and increasing use of the internet and communication technologies (Sani et al., 2024). For instance, a significant advancement facilitated by technology in education has revolutionized the acquisition and sharing of knowledge (Fauziya, 2023). Education without the use of technology has almost begun to be considered poor quality, and efforts are being made to integrate technology into every activity of education (Suryavanshi & Mandale, 2022). In addition, there are different key drivers for integrating technology into learning, for example, improving learning outcomes and student digital learning skills, improving access to learning and increasing student motivation (Bower, 2017). Technology in education refers to the use of various technological tools such as audio-visual aids tools, communication media, computers and the internet and applications for learning (Birajdar et al., 2020). In the second decade of the 21st century, all stakeholders in education, including students, teachers, educational institutions, etc., benefit from these tools and applications (Berges-Puyo, 2024). However, since the effects of technology use in education have not been studied in detail, this study aims to address this gap by examining university students' technology use habits in education and identifying the factors that shape these behaviors. Specifically, it investigates how social and cultural activities, digital tools, and perceptions of the advantages and limitations of technology interact to influence educational practices. Through a robust quantitative methodology using ordered logistic and probit regression models, this research aims to provide educators, policy makers, and technology experts with actionable insights in optimizing the integration of digital tools in higher education. By shedding light on the nuanced relationship between technology and education, this study contributes to a deeper understanding of how digital advancements can be used to address inherent challenges while enhancing learning experiences. As technology continues to redefine the educational landscape, such research is crucial to navigating the complexities of this digital transformation and ensuring its benefits are equitably distributed across diverse student populations.

Literature Review

Phillips (2010) stated that technological equipment, including digital cameras, online testing, graphing calculators, the Internet, and computers are crucial in mathematics education and enhance students' math problem solving skills.

Baliga (2015) listed improving the quality of learning and teaching, enriching education, access to education at all levels and improving management systems as important reasons for implementation of technology in education. He also stated that technology in education provides benefits such as equal opportunity in education, individual and self-learning, reduction of costs, reduction of the effect of time and distance, acceleration of education, acquisition of more skills and knowledge.

Slechtova (2015) collected data through a survey from 200 students in four fields of study consisting of clinical social worker, applied informatics, computer systems and travel and tourism in order to examine students' attitudes and opinions regarding the use of ICT in education. According to the results of the study, while computer systems and applied informatics students were expected to have high attitudes towards the use of ICT, travel and tourism students showed more positive and open attitudes, although they were not very skilled in the use of ICT. In addition, it has been determined that Clinical Social Worker students are willing to improve in the field of ICT,

even though they appear to be the students with the least skills in the field of ICT when compared to others.

Roy (2019) talked about the use of technological equipment such as smart digital whiteboards, smartphones, computers and iPads in education and discussed the positive effects of technology when learning English. He pointed out that technology causes low costs and stated the general changes in global communication as the biggest reason for including technology in education.

Ubaidillah et al., (2020) distributed an online questionnaire between 113 students and focused on their understanding of the use of technology in learning. The result of the study showed that perceived usefulness affected students' perceptions of the use of technology in education and that there was a satisfactory level of technology use among the participants.

Joshi (2023) discussed the importance of technology in education, especially the use of audio-visual equipment, recording media and computers, and emphasized the use of hardware, innovative media and machine industry methods for Education. He also mentioned the importance of software in promoting learning and motivation and the revolution that the integration of technology in education has created in traditional teaching methods.

Different researchers have examined the use of mobile phones in education. Eriş, Havlioğlu, and Kaya (2021) collected data on 335 university students through a survey to examine the effects of mobile phones on their academic success. According to the results of the study, it was determined that mobile phone use has a negative effect on academic success. On the other hand, in a survey conducted by Frimpong, Arthur and Asare (2016) on 306 students, 91.5% of the participants think that mobile phone use positively affects their academic performance. In addition, Pozos-Pérez et al (2022) examined Mobile Phone Use in three educational centers in Barcelona using qualitative research based on co-design, case studies and content analysis. The results showed that the importance of mobile phones in the classroom has decreased, schools tend to ban mobile phone use, and prioritize safe use of the internet and computers.

Many studies have examined the effects of digital games on students' achievement and motivation. Papastergiou (2009) examined the impact of digital games on Greek high school Computer Science students. Data analysis showed that the educational computer games have improved students' learning and motivation. Rosas et al. (2003) conducted an experimental study on 1274 students in Chile to examine the effect of educational video games on education and motivation. The result of the study showed that educational video games provide an improvement in learning motivation, positively affect motivation and classroom dynamics, and are a useful tool in promoting learning. Liao et al (2011) used a pet raising game to engage students in arithmetic practice. The results showed that the strategy encouraged students to engage in learning activities. Additionally, the game motivated students, attracted their attention and encouraged discussion among them.

Methodology

Research Design, Sample and Variables

The population of this quantitative and cross-sectional study consists of formal and secondary education university students who were determined by convenience sampling method. In this study, data was obtained from 1008 students through a questionnaire consisting of 65 questions in order to investigate the habit of using technology in education. The first part of the designed questionnaire contains demographic characteristics, and the second part contains variables to determine the participants' technology use habits in education. Ordered logistic regression and ordered probit regression statistical models were used in the study. Because it is claimed that these models provide more reliable results in cases where the dependent variable takes ordinal values (Alipour et al., 2023a; Pourmousa et al., 2023a). In addition, these models investigate the relationship between the dependent variable and several independent (explanatory) variables and show which independent variable has a strong impact on the dependent variable (Eygü, 2024). For example, ordinal logistic regression has been used for disinformation on social media (Alipour et al., 2023b), addiction to digital games (Pourmousa et al., 2023b), while both models have been used for financial literacy (Alkan et al., 2020) and distance education (Eygü, 2024).

Research Method

The IBM SPSS 27 and Stata 17 programs were used to analyze the data. Firstly, frequency values and percentage were obtained to measure the participants' technology use habits in education. Secondly, the chi-square independence test was performed to examine the relationship between levels of technology use in education and various independent variables. Finally, ordered logistic regression and ordered probit regression analysis were used to determine the factors identified in the previous step.

Findings

Before analyzing the data, the reliability test, which is one of the basic features that should be calculated in the survey and examines the consistency of the scale, was first carried out. The reliability of the survey shows the extent to which the measurement tool gives the same results under the same conditions (Carey, 1988; Carmines, 1979). The Cronbach's alpha is obtained based on the average covariance (or correlation) of the questions in a questionnaire. It takes values between 0 and 1, and the value being close to 1 indicates the high reliability of the scale (Özen, Çam and Pourmousa, 2017). The reliability of the scale was obtained as 0.897. The demographic characteristics of the students participating in the study are presented in Table 1.

Table 1. Demographic Characteristics

Variable	Frequency	Percentage	Use of Technology in Education			
			Little	Middle	A lot	
Gender						
Female	559	55.5	47(8.4%)	122 (21.8%)	390 (69.8%)	
Male	449	44.5	57 (12.7%)	92 (20.5%)	300 (66.8%)	
Age						
18-20	536	53.2	61 (11.4%)	111 (20.7%)	364 (67.9%)	
21-24	413	41.0	35 (8.5%)	94 (22.8%)	284 (68.8%)	
25+	59	5.8	8 (13.6%)	9 (15.3%)	42 (71.2%)	
Department						
Social	257	25.5	38 (14.8%)	47 (18.3%)	172 (66.9%)	
Education	167	16.6	17 (10.2%)	23 (13.8%)	127 (76.0%)	
Science	192	19.0	13 (6.8%)	50 (26.0%)	129 (67.2%)	
Fine Arts	296	29.4	30 (10.1%)	78 (26.4%)	188 (63.5%)	
Health	65	6.4	6 (9.2%)	8 (12.3%)	51 (78.5%)	
Sport	31	3.1	0 (0.0%)	8 (25.8%)	23 (74.2%)	

55.5% of the participants were female and 44.5% were male. Most of the participants are between the ages of 18-20 and are fine arts students. 69.8% of female students and 66.8% of male students use technology a lot in education. 67.9% of students aged between 18-20, 68.8% of students aged between 21-24 and 71.2% of students over the age of 24 use technology a lot in education. 66.9% of students in the social department, 76.0% of students in the education department, 67.2% of students in the science department, 63.5% of students in the fine arts department, 78.5% of students in the health department and 74.2% of students in the sport department use technology a lot in education.

Since the dependent variable has an ordered categorical result in this study, ordered logistic regression and ordered probit regression models were used to examine the factors affecting the use of technology in education. Before starting the analysis, multicollinearity between the independent variables of the model was tested with the Variance Inflation Factor (VIF), which is an important statistical tool and used to detect multicollinearity in linear regression models (Salmerón, García and García, 2020). Multicollinearity, a common problem in regression analysis, can lead to problems with the statistical significance of the independent variables and the overall model. (Lavery et al., 2019). VIF values are usually interpreted this way: 1) $VIF = 1$: There is no multicollinearity. 2) $1 < VIF < 5$: There is an acceptable level of multicollinearity. 3) $VIF > 5$: Multicollinearity may occur and caution should be taken. 4) $VIF > 10$: There is a serious multicollinearity problem and the model may need to be re-evaluated (Bagheri, Habshah, and Imon, 2012; James et al., 2013; Alkan, Oktay, and Genç, 2015). All VIF values which are given in table 2, are between 1 and 5 and are close to 1, so it stated that there is no multicollinearity problem between the independent variables in this study.

The margin effects of ordered logistic regression and ordered probit regression models are given in table 2. In the dependent variable, “A lot” was used as the reference category. In the continuation of the analysis, it was tested

whether the ordered logistic regression model provided parallel regression and the results are presented in table 3. In addition, Pseudo R2, Cox-Snell/M, AIC, BIC and P-value values are given in table 4.

Table 2. The results of ordered logistic and probit regression models and marginal effects

Ordered Logistic Regression					Ordered Probit Regression				VIF
Variables	dy/dx				dy/dx				
	β	Little	Middle	A lot	β	Little	Middle	A lot	
Spending Time with My Friends (Reference Category: Often)									
Rarely	-0.639a	0.049a	0.054a	-0.103a	-0.384a	0.054a	0.053a	-0.107a	1.18
	(0.211)	(0.018)	(0.018)	(0.036)	(0.122)	(0.019)	(0.017)	(0.036)	
Occasionally	-0.519a	0.038a	0.044a	-0.083a	-0.337a	0.046a	0.047a	-0.094a	1.16
	(0.187)	(0.015)	(0.016)	(0.031)	(0.107)	(0.016)	(0.015)	(0.030)	
Participating in Culture-Art Activities (Reference Category: Often)									
Rarely	0.437b	-0.031b	-0.035b	0.065b	0.239b	-0.031b	-0.031b	0.062b	1.69
	(0.214)	(0.015)	(0.016)	(0.032)	(0.119)	(0.016)	(0.015)	(0.031)	
Occasionally	-0.067	0.005	0.005	-0.011	-0.035	0.005	0.004	-0.010	1.49
	(0.204)	(0.016)	(0.016)	(0.032)	(0.114)	(0.017)	(0.015)	(0.031)	
Reading Article, Story, Novel etc. (Reference Category: Often)									
Rarely	0.479b	-0.038b	-0.037b	0.075b	0.281b	-0.041b	-0.036b	0.007b	1.82
	(0.212)	(0.017)	(0.016)	(0.033)	(0.121)	(0.018)	(0.015)	(0.033)	
Occasionally	0.629a	-0.048a	-0.050a	0.097a	0.381a	-0.053a	-0.049a	0.102a	1.56
	(0.207)	(0.016)	(0.016)	(0.032)	(0.118)	(0.017)	(0.015)	(0.030)	
Doing Research (Reference Category: Often)									
Rarely	-0.385c	0.028b	0.032c	-0.060c	-0.198	0.026	0.027	-0.054	1.71
	(0.224)	(0.016)	(0.019)	(0.035)	(0.128)	(0.017)	(0.018)	(0.035)	
Occasionally	-0.303	0.021	0.025	-0.047	-0.160	0.021	0.022	-0.043	1.49
	(0.200)	(0.014)	(0.017)	(0.031)	(0.112)	(0.015)	(0.016)	(0.030)	
Shopping (Reference Category: Often)									
Rarely	0.385c	-0.028c	-0.030c	0.059c	0.236b	-0.032b	-0.031b	0.062b	1.36
	(0.205)	(0.015)	(0.016)	(0.031)	(0.118)	(0.015)	(0.015)	(0.030)	
Occasionally	0.330c	0.025c	-0.026c	0.051c	0.155	-0.022	-0.020	0.042	1.25
	(0.187)	(0.014)	(0.015)	(0.028)	(0.105)	(0.014)	(0.014)	(0.028)	
Gain Knowledge (Reference Category: Often)									
Rarely	-0.819a	0.063a	0.070a	-0.133a	-0.445a	0.063a	0.062a	-0.125a	1.35
	(0.236)	(0.020)	(0.021)	(0.040)	(0.135)	(0.021)	(0.019)	(0.040)	
Occasionally	-0.635a	0.046a	0.055a	-0.100a	-0.338a	0.045a	0.048a	-0.093a	1.29
	(0.184)	(0.014)	(0.017)	(0.030)	(0.106)	(0.015)	(0.015)	(0.030)	
Online Course Platforms: Canvas, Blackboard, Edmodo, Udemy... (Reference Category: Often)									
Rarely	-0.435c	0.030c	0.036c	-0.070c	-0.237c	0.031c	0.033c	-0.064c	2.19
	(0.244)	(0.016)	(0.021)	(0.037)	(0.135)	(0.016)	(0.019)	(0.036)	
Occasionally	-0.190	0.012	0.016	-0.028	-0.077	0.009	0.011	-0.020	1.83
	(0.267)	(0.017)	(0.022)	(0.040)	(0.146)	(0.017)	(0.020)	(0.038)	
Smart Boards, Tablets, Smartphones... (Reference Category: Often)									

Rarely	-0.624a (0.192)	0.045a (0.014)	0.055a (0.018)	-0.100a (0.012)	-0.360a (0.110)	0.049a (0.016)	0.052a (0.017)	-0.101a (0.032)	1.48
Occasionally	-0.400c (0.212)	0.027c (0.015)	0.035c (0.019)	-0.062c (0.034)	-0.232c (0.119)	0.029c (0.016)	0.034c (0.018)	-0.063c (0.033)	1.31
Online Collaboration Tools: Microsoft Teams, Slack, Zoom... (Reference Category: Often)									
Rarely	-0.509b (0.203)	0.038b (0.015)	0.043b (0.018)	-0.080b (0.032)	-0.283b (0.116)	0.039b (0.015)	0.039b (0.017)	-0.078b (0.032)	1.75
Occasionally	0.048 (0.225)	-0.003 (0.014)	-0.004 (0.019)	0.007 (0.033)	0.037 (0.127)	-0.004 (0.015)	-0.005 (0.018)	0.009 (0.033)	1.45
It frees the student. (Reference Category: Agree)									
Disagree	-0.491b (0.240)	0.037c (0.019)	0.042b (0.021)	-0.079c (0.040)	-0.268c (0.141)	0.037c (0.021)	0.038c (0.020)	-0.074c (0.041)	1.50
Undecided	-0.428b (0.191)	0.031b (0.015)	0.037b (0.017)	-0.068b (0.031)	-0.266b (0.109)	0.036b (0.016)	0.037b (0.016)	-0.074b (0.031)	1.39
It makes students love the lesson and learning. (Reference Category: Agree)									
Disagree	-0.484b (0.239)	0.038c (0.020)	0.040c (0.020)	-0.078c (0.040)	-0.269c (0.139)	0.039c (0.021)	0.036c (0.019)	-0.075c (0.040)	1.66
Undecided	-0.145 (0.193)	0.010 (0.014)	0.012 (0.016)	-0.022 (0.030)	-0.058 (0.111)	0.007 (0.014)	0.008 (0.015)	-0.015 (0.030)	1.37
It socializes the students by increasing their communication skills. (Reference Category: Agree)									
Disagree	-0.414c (0.217)	0.031c (0.017)	0.035c (0.019)	-0.066c (0.035)	-0.257b (0.123)	0.036b (0.018)	0.035b (0.017)	-0.071b (0.035)	1.61
Undecided	-0.179 (0.201)	0.013 (0.014)	0.015 (0.017)	-0.028 (0.031)	-0.114 (0.114)	0.015 (0.015)	0.016 (0.016)	-0.031 (0.031)	1.40
It increases communication with family. (Reference Category: Agree)									
Disagree	-0.473b (0.207)	0.033b (0.015)	0.040b (0.018)	-0.074b (0.033)	-0.288b (0.117)	0.037b (0.015)	0.041b (0.017)	-0.078b (0.032)	1.61
Undecided	-0.457b (0.215)	0.032b (0.015)	0.039b (0.019)	-0.071b (0.034)	-0.275b (0.121)	0.036b (0.016)	0.039b (0.018)	-0.075b (0.033)	1.54
Online course materials and resources help students with understanding the course. (Reference Category: Agree)									
Disagree	-0.477b (0.218)	0.036b (0.017)	0.041b (0.019)	-0.077b (0.037)	-0.257b (0.127)	0.036c (0.019)	0.036c (0.018)	-0.072c (0.037)	1.52
Undecided	-0.332c (0.198)	0.024 (0.015)	0.029 (0.017)	-0.053 (0.032)	-0.166 (0.114)	0.022 (0.016)	0.023 (0.016)	-0.045 (0.032)	1.27
Interactive software used in education makes the subjects more attractive. (Reference Category: Agree)									
Disagree	0.595b (0.250)	-0.039b (0.015)	-0.046b (0.018)	0.085b (0.033)	0.292b (0.142)	-0.036b (0.016)	-0.038b (0.017)	0.074b (0.034)	1.62
Undecided	-0.058 (0.188)	0.005 (0.015)	0.004 (0.014)	-0.009 (0.029)	-0.029 (0.108)	0.004 (0.015)	0.004 (0.014)	-0.008 (0.029)	1.25
Assessment tools on online learning platforms increase academic success. (Reference Category: Agree)									
Disagree	-0.938a (0.226)	0.078a (0.021)	0.080a (0.020)	-0.158a (0.040)	-0.538a (0.131)	0.083a (0.023)	0.074a (0.019)	-0.157a (0.040)	1.60
Undecided	-0.158 (0.194)	0.010 (0.013)	0.014 (0.017)	-0.024 (0.030)	-0.071 (0.112)	0.009 (0.014)	0.010 (0.016)	-0.019 (0.030)	1.29

The topics and content in the courses gradually increase. (Reference Category: Agree)

Disagree	-0.369c (0.212)	0.026c (0.016)	0.031c (0.018)	-0.057c (0.033)	-0.206c (0.120)	0.027c (0.016)	0.029c (0.017)	-0.056c (0.033)	1.48
Undecided	-0.533a (0.189)	0.040a (0.015)	0.045a (0.017)	-0.084a (0.031)	-0.305a (0.108)	0.042a (0.015)	0.042a (0.015)	-0.084a (0.030)	1.29

It reduces the opportunities for face-to-face meetings with trainers and instructors. (Reference Category: Agree)

Disagree	-0.568a (0.209)	0.042b (0.016)	0.049a (0.019)	-0.091a (0.035)	-0.300b (0.120)	0.041b (0.017)	0.042b (0.017)	-0.083b (0.034)	1.49
Undecided	-0.511b (0.202)	0.037b (0.016)	0.044b (0.018)	-0.081b (0.033)	-0.290b (0.116)	0.039b (0.017)	0.041b (0.017)	0.080b (0.033)	1.26
Cut1	-5.149 (0.316)				-2.895 (0.163)				
Cut2	-3.315 (0.281)				-1.872 (0.150)				

Note. ^a $p < .01$; ^b $p < .05$; ^c $p < .10$; The values in parentheses are the standard errors. Statistics were calculated by reducing the five-point Likert scale to three.

Table 3. Parallel Regression Test Results

	Chi2	df	P>Chi2
Wolfe Gould	22.26	18	0.221
Brant	21.81	18	0.241
Score	23.48	18	0.173
Likelihood Ratio	24.01	18	0.155
Wald	23.89	18	0.159

Table 4. Comparison of models

Criteria	Ordered Logistic Regression	Ordered Probit Regression
Pseudo R2	0.1807	0.1772
Cox-Snell	0.280	0.276
AIC	1781.636	1404.934
BIC	1875.034	1503.249
P-value	0.0000	0.0000
N	1008	1008

Discussion

The increasing use of technology, which started with the pandemic period, has affected the field of education more than any other field. In addition, the earthquake that occurred in Turkey increased the use and integration of technology in education. Therefore, in this study, the factors affecting the use of technology in education were examined with ordered logistic regression and ordered probit regression models. Demographic characteristics, daily activities, purpose of social media use, use of different technologies in education, positive and negative

effects of technology use on students and their academic success were examined within the scope of the study.

The increase in the use of technology in education adds importance to examining its effect on academic performance. However, many studies have only examined the use of computers and phones and their effects on academic achievement (Tyutryumova and Pomytkina, 2021; Hidayah and Humaidi, 2022; Saleh and Jalambo, 2022; Al-Ali, 2023; Allah and Hewary, 2023; Singh, Aggarwal, and Mathur, 2023; Mensah and Ampadu, 2024). In this study, in addition to computers and phones, the use of technologies such as online course platforms, e-books and digital materials, smart boards, tablets, smartphones, video conference and virtual classrooms, student monitoring and evaluation tools, digital drawing and note-taking tools, adaptive learning systems, online collaboration tools and simulation and virtual reality tools was examined for the first time in Turkish studies.

Parallel regression shows that the assumptions are not violated, and its results are presented in table 3. The results of the parallel regression show that the models are valid. In this context, margin values were calculated and presented in table 2. Additionally, according to the comparison criteria of the models given in Table 4, the ordered probit regression model shows a superior performance than the ordered logistic regression model with lower AIC and BIC values. However, it appears that both models have similar explanatory power in terms of Pseudo R^2 and Cox-Snell R^2 values. Therefore, when choosing a model, the ordered probit regression model can be preferred by paying more attention to AIC and BIC values. For this reason, analyzes were carried out based on the ordered probit regression model in the continuation of the study.

It was concluded that spending time with friends and participating in culture-art activities in daily activities showed a significant impact on technology use in education in both ordered logistic regression and ordered probit regression models. Students who rarely spend time with their friends had a low level of technology use in education. Nowadays, spending time with friends is not only done in close proximity but also through technologies. Therefore, it can be considered as a factor in the use of technology in education. For example, Rosas et al. (2003) showed that playing video games with friends has a positive effect on academic performance. In addition, it was revealed that students who rarely participate in cultural-art activities use technology in education more than students who often participate these activities.

It was found out that reading article, story, novel etc., shopping and gain knowledge in reason for using social media had a significant impact on technology use in education in both models. However, while doing research did not show a significant effect in the ordered probit regression model, it had a significant effect on technology use in education in the ordered logistic regression model. Students who occasionally read article, story, novel etc. in social media had a high level of technology use in education. In addition, students who rarely do shopping in social media use technology in education more than students who often do shopping. Besides, students who rarely gain knowledge in social media had a low level of technology use in education. These results are mirrored by those of Aldahdouh, Nokelainen, and Korhonen (2020), who examined social media use and the use of technological devices in education.

It was determined that use of online course platforms, smart boards, tablets, smartphones and online collaboration tools in education had a significant impact on technology use in education in both models. Students who rarely

use online course platforms use technology in education less than students who often use these platforms. Moreover, it was revealed that students who use smart boards, tablets, smartphones in education had a low level of technology use in education and students who rarely use collaboration tools in education use technology in education less than students who often use these tools. As can be understood from the results, those who use technological devices generally use these devices for education. The results of some researchers such as Tamim et al. (2015) and Wen and Walters (2022) have shown that the use of tablets, smartphones and other technologies in education is effective and increases the performance of students.

When students' thoughts about the effects of technology use in education are examined, technology using in education among students who disagree with "It frees the student.", "It makes students love the lesson and learning.", "It socializes the students by increasing their communication skills." and "It increases communication with family." are %23.5, %23.6, %22.7 and %25.0 respectively lower than the students who agree with these statements (based on ordered probit regression).

$$\text{Odds Ratio (It frees the student.)} = e^{\beta} = e^{-0.268} = 0.765$$

$$\text{Percentage change (It frees the student.)} = (1 - e^{\beta}) * 100 = (1 - 0.765) * 100 = 23.5\%$$

Considering the statements about the positive effects of using technology in education on academic performance, technology using in education among students who disagree with "Online course materials and resources help students with understanding the course." and "Assessment tools on online learning platforms increase academic success." are %22.7 and %41.6 respectively lower than the students who agree with the statements. Carstens et al. (2021) reported that the use of technology in education makes students more interested and has a motivating effect. In addition, Dabbagh, Fake and Zhang (2019) mentioned the positive aspects of the use of technology in education and argued that it encourages discussion, collaboration and interaction. However, technology using in education among students who disagree with "Interactive software used in education makes the subjects more attractive." is %33.9 more than the students who agree with the statement (based on ordered probit regression).

In light of the statements about the negative effects of using technology in education on academic performance, technology using in education among students who disagree with "The topics and content in the courses gradually increase." and "It reduces the opportunities for face-to-face meetings with trainers and instructors." are %18.6 and %25.9 respectively lower than the students who agree with the statements (based on ordered logistic regression). As Alhumaid (2019) emphasizes, the most distinctive feature of technology-based education is the lack of a sense of collectivism or togetherness. In addition, the results obtained are consistent with the results of Vázquez Cano et al. (2022). In their study, they stated that the negative impact on academic performance of the students, the lack of resources for its implementation in the classrooms and the infocination.

Conclusion

In recent years, technology has become an integral part of education due to pandemics, earthquakes and the rapid advancement of technology. In addition, the advancement of artificial intelligence, the spread of distance

education and the fact that students benefit from technology instead of traditional methods have increased the use of technology in education. The increasing use of technology in education is an important reason for this study. 68.5% of the students participating in the study emphasized this fact by stating that they frequently use technology in education.

In light of the findings obtained in this study, students' positive perspectives on the use of technology in education are an indicator of how the education industry should progress in the future. In addition, students' perspectives regarding the positive effects of using technology in education on academic success indicate the advantages and benefits of technology in education. Moreover, it should be examined how to change students' perspectives, taking into account students' concerns about the increase in content and the decrease in face-to-face education opportunities.

The results of the study guide the education industry and academics, as well as encourage psychologists and sociologists to examine why students turn to the use of technology in education and believe that they are freed. Thus, it provides the opportunity for university computer centers and psychologists and sociologists to work together to examine what effects the use of technology in education may have in the future.

It is necessary to investigate whether the use of technology in education causes an increase in computer literacy, and if it does not, the technologies used in education should be reviewed to ensure that it leads to an increase in the computer literacy of students and academics. Additionally, considering the rapid change of technology, continuous training should be provided on how students and academics can learn new technologies and use them in education.

Since the data in this study were obtained only from students studying in the east of Türkiye, it cannot be generalized to Turkey. Factors affecting the use of technology in education and their impact rates were determined according to student responses. Therefore, the results may be biased. The lack of open-ended questions in this study might have limited students' ability to provide detailed responses. In addition, since the use of technology in education may vary in different regions and the region where the research took place is a low-income region, the results obtained can be compared with other regions and regional differences can be examined.

Statements and Declarations

The authors declare that they have no financial or non-financial competing interests that could have influenced the work presented in this manuscript. The research was conducted independently, and no external funding or support was received that could potentially lead to a conflict of interest.

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