

Determination of information and communication technologies attitudes of university students that received physical education and sports

Muhammed Baran Karahan and Oktay Kaya*

Kafkas University, Turkey.

Accepted 28 April, 2023

ABSTRACT

This research was conducted to determine the attitudes of university students with different socio-economic structures towards information and communication technologies, using information and communication technologies (ICT), which are increasingly used in our daily life, by using a descriptive survey model and survey method. Günbatar (2014) and analyzed for validity and reliability, was used to determine the level of use of information and communication technologies by university students receiving Physical Education and Sports Education. The universe of the research consists of students studying at universities that provide sports education in Turkey. The sample consists of 166 students from Kafkas University, 172 students from Iğdır University and 164 students from Ardahan University, students studying in Physical Education and Sports Teaching, Coaching Education and Sports Management departments of Physical Education and Sports Schools of universities located in the Eastern Anatolia Region of Turkey. This study aims to determine the beliefs, opinions, perceptions and attitudes of university students who receive Physical Education and Sports education toward the integration of technology into physical education with students who are currently studying in higher education. A literature review of information and communication technologies was made in the first part of the investigation. In the second part, the attitude scale was used. The data obtained were evaluated in the SPSS 22.0 package program. Kaiser-Meyer-Olkin (KMO) test and Barlett test were conducted to evaluate the suitability of the attitudes of university students who receive sports education towards information and communication technologies for factor analysis. Analysis of Variance in the comparison of multiple groups (LSD was used in cases where variances were homogeneous, Dunnet C was used in cases where they were not). Internal Validity With Cronbach α coefficient, normality distribution of data with Kurtosis and Skewness coefficients, frequency, percentage, mean, standard deviation, one-way data analysis Anova and t-test were used for independent groups. The significance level of the statistical analysis was accepted as $p < 0.05$. The difference in the mean score of the General ICT Tendency sub-dimension according to the university of education was found to be statistically significant ($p < 0.05$). It was observed that there were significant differences in the dimensions of communication in the virtual environment between universities ($p < 0.05$). The difference in the Software Use sub-dimension mean score according to the university of education was statistically significant ($p < 0.05$). The difference in the mean score of the Virtual Environment Information Access sub-dimension according to the departments was statistically significant ($p < 0.05$). It is thought that this research will create a gain in terms of determining the attitudes of university students who receive sports education toward information and communication technologies.

Keywords: Sport, physical education, attitude, knowledge, communication, technology.

*Corresponding author. E-mail: oktaykaya3623@gmail.com.

INTRODUCTION

Education is defined as the process of targeted outcomes that result in certain and desired progresses in individuals' behaviors according to predetermined objectives. Since the content and application methods of education are different, there are numerous definitions of education and therefore education is discussed from different perspectives. According to Smith, Stanley and Shores (1957) and Good (1959); even if education is accepted as all of the social processes that are effective in making human societies attain their norms, beliefs and lifestyles, it is the whole of processes that develop individual's skills, attitudes and other forms.

Physical education and sports are considered scientific branch that improves people's physical and mental health and is defined as educational activity directly associated with their psychological and character growth. Physical education contributes to the development of character and personality, too; because strong ties, team spirit, and group interaction are the features seen in game and sportive fields. Integration between teammates and the opponent also plays an effective role in attaining social integration. Physical education and sports improve physical fitness, health and preventive habits; permit skill development and mental development and contribute to democratic processes. Game is an instinctive drive and has educational potential and the dynamic structure of the games used in physical education can be used for individuals to gain more appropriate behavioral forms (Bucher, 1987).

Information technologies refer to the whole of technologies that electronically facilitate collecting, processing and saving information, transferring it to anywhere, or obtaining it from anywhere (Turkish Language Society, 2020).

Communication is originally derived from the Latin word "communis" meaning society, community, or association (Oskay, 2000). Conceptual definitions of communication depend on the targeted topic. Communication is the transmission and exchange of one's feelings, opinions, or information to someone else via any kind of instrument that can be accepted as an information exchange or communication tool such as a phone, telegraph or radio, etc. In other words, communication is defined as information exchange, mutual transmission of messages and transferring information, feeling and thoughts from one side to another (Arslan, 2016). Communication is named according to the channel and coding to which the message is wanted to be sent.

Attitude is the cognitive, emotional and behavioral response and predisposition that individuals organize based on experience, motivation and knowledge in relation to any social topic, object, or incident in the self or their environment (İnceoğlu, 1993). Attitude is one's permanent feelings, predispositions, partiality, neutrality

or assessments as to an object or opinion. Attitudes consist of three basic components. These three basic components are cognitive, emotional and behavioral. It is very critical to use these three components effectively while forming a new attitude or changing the existing ones (Koç, 2007).

Information and communication technologies (ICT) are considered a way to expand 21st-century skills in almost all educational fields, particularly in schools. Communication exists in all phases of life and appears to be gaining importance in traditional education systems as well as in the physical education doctrine, namely, physical education and sports discipline as the necessity of the modern era. Likewise; World Health Organization, fighting against inactivity for a healthy life, theoretically regards it as necessary to study a large discipline, such as social activity invitations, at schools as is (Rutkowski et al., 2011; Vockley, 2007).

Discussions including ICT and physical education and sports (SPES) discipline as a part of lifestyle heavily include technology integration into modern classrooms; one of the reasons is that this discipline is structured with physical activities and, as proved many times, physical activities performed all together increase participation motivation (Kretschmann, 2010; Mohnsen, 2012).

Various teaching clues and pedagogical scenarios have been presented in literature so that physical education teachers can integrate technology into physical education (Whalen and Fiorentino, 2006; Castelli and Fiorentino, 2008).

The scope of using technology in physical education ranges from computers, laptop computers and tablets (Juniu, 2011; Leight and Nichols, 2012), physical activity measuring devices (McCaughy et al., 2008) to online activity works (Martin et al., 2012; McNeill, Mukherjee and Singh, 2010) and active video game discussions; which shows the importance of disciplinary integration.

On the higher education level, programs of physical education teacher education (PETE) have been taking their part in ICT discussions since then (Leight and Nichols, 2012).

Studies on the ICT competency of university students who study physical education and sports seem to partly be more complicated. Of these two disciplines, the subdimension of ICT known as communication technologies and subdimensions of physical education and sports (PETE, etc.) demonstrate this complication. In this sense, it is the basic motivation of this thesis study to demonstrate how physical education and sports students perceive and see ICT integration in physical education courses and to uncover their attitudes and opinions which means that future teachers are able to measure their own professional knowledge (Yaman, 2008).

Today, sports education is taught at departments of

physical education and sports teaching of education faculties, at schools of physical education and sports, at faculties of sports sciences, at faculties of health sciences, at schools of sports sciences technology and schools of applied sciences as undergraduate degrees and graduate degrees (Şimşek, 2018).

With this study, based on new technological initiatives in the education of university students who study physical education and sports (PES) with undergraduate degrees, graduate degrees and doctorate degrees; it is important to understand their attitudes towards ICT because a frame of PES that is integrated into ICT is thought to help us get readier for digital education systems to which we resorted during hard times –for example during COVID pandemic just starting to end. On the other hand; this study will make an important contribution to the literature because it has been conducted with a large study population and a large sample size consisting of three universities.

Conducting this study with those students who have already been studying in higher education was the basic objective in order to determine their beliefs, views, perceptions and attitudes towards the integration of technology into physical education. Besides, as the studies of Albirini (2006) and Baylor and Ritchie (2002) suggested that the use of technology as a part of the educational frame is hugely affected by the attitudes of physical education and sports teachers, coaches, sports managers, and/or candidates towards the use of technology and their thoughts about how PES field has been/will be integrated into technology will be discussed.

MATERIALS AND METHODS

The basic objective of our study is to determine, assess and compare the beliefs, views, perceptions and attitudes of the students studying physical education and sports education in the Eastern Anatolia Region, Türkiye towards the integration of technology into physical education between 2021-2022 academic year. In light of the data to be obtained, the aim was to discover how the integration of technology into physical education and students' beliefs, views, perceptions and attitudes were correlated using correlation tests. The population of the study consisted of those university students studying physical education and sports education in Türkiye. The sample of the study consisted of those students recruited using the random sampling method -166 students from Kafkas University, 172 students from Iğdır University, and 164 students from Ardahan University located in the Eastern Anatolia Region who studied at the departments of physical education and sports teaching, the department of coaching and the department of sports management.

In order to explore the level of use of information and

communication technologies by university students studying physical education and sports education; the factor structure of the "Information and Communication Technology Attitude Scale (ICTAS)" developed by Günbatar (2014) was found using explanatory factor analysis (EFA) and then was tested with confirmatory factor analysis (CFA). It included figures regarding inter-item correlations, item-test correlations, Cronbach Alpha coefficients, test-retest reliability, Keiser-Meyer-Olkin (KMO) and Bartlett's test. The scale consisted of 23 questions. The factors are named by Günbatar (2014) as a general tendency of ICT (1st, 2nd, 3rd, 4th, 5th and 6th items), access to information in virtual environments (7th, 8th, 9th, 10th and 11th items), computer hardware (12th, 13th, 14th and 15th items), (16th, 17th, 18th, 19th and 20th items) and (21st, 22nd and 23rd items). The scale has five factors. Each question is rated as strongly agree (5), agree (4), neutral (3), disagree (2), or strongly disagree (1). Internal coefficients of the factors are 0.89, 0.84, 0.81, 0.82 and 0.76, respectively.

The first part of the scale-covered 7 questions to explore the demographic characteristics of the participant students. These questions addressed the variables of "the university where they study", "Faculty/School", "Department", "Grade", "Gender", "Age" and "Income". In the study, the factors that would explore the attitudes of the students toward information and communication technologies were investigated.

SPSS 22.0 statistical software was employed for the statistical analyses in order to assess the findings. Before testing the study hypotheses, a test of normality was conducted. As a result, the data were identified to follow a normal distribution. In order to assess the descriptive qualities of the respondents; such measurement procedures as numbers, means, standard deviations, frequencies and percentage distributions were used. In order to compare the two groups, Independent-Samples t-Test and One-Way ANOVA to compare two or more groups were employed. Reliability analysis and factor analysis were performed. In order to demonstrate demographic characteristics, frequency tables were used.

FINDINGS

As seen in Table 1, 83.9% of the participants were aged between 21 and 30 years.

As seen in Table 2, 44.8% of the participants reported income status as "I need support/scholarship".

As seen in Table 3, the highest response "strongly disagree" was given by the participants to the 15th item "I can disassemble and assemble a computer." The highest response "disagree" was given by the participants to the 13th item "I enjoy handling the components of a computer." The highest response "neutral" was given by the participants to the 16th item "I like enriching my

Table 1. Distribution of the ages.

		n	%
Age	17-20 years	72	14.3
	21-30 years	421	83.9
	31-40 years	8	1.6
	41-50 years	1	0.2

Table 2. Distribution of the incomes of the participants.

		n	%
Income	I need support/scholarship	225	44.8
	I hardly live on my income	154	30.7
	Moderately satisfactory	74	14.7
	Satisfactory	37	7.4
	Very satisfactory	12	2.4

Table 3. Statistical data as to ICTAS.

	Strongly disagree		Disagree		Neutral		Agree		Strongly Agree	
	n	%	n	%	n	%	n	%	n	%
I like using ICT in my daily life.	63	12.5	60	12.0	125	24.9	135	26.9	119	23.7
It is a great pleasure to use ICT in my daily life.	35	7.0	82	16.3	145	28.9	145	28.9	95	18.9
Using ICT makes our lives easy.	29	5.8	75	14.9	95	18.9	167	33.3	136	27.1
It is inevitable to use ICT in our daily life.	40	8.0	64	12.7	109	21.7	170	33.9	119	23.7
Advances in ICT make me excited.	45	9.0	74	14.7	139	27.7	149	29.7	95	18.9
I do my jobs easily by using ICT.	40	8.0	40	8.0	134	26.7	164	32.7	124	24.7
I think detailed searching on internet by using search-engines (Google, Altavista etc.) is easy.	27	5.4	52	10.4	114	22.7	141	28.1	168	33.5
I prefer internet while searching.	35	7.0	44	8.8	109	21.7	142	28.3	172	34.3
Reaching information by using search engines on the Internet (Google, Altavista, etc.) gives me pleasure.	28	5.6	49	9.8	123	24.5	163	32.5	139	27.7
I like searching the Internet.	36	7.2	45	9.0	113	22.5	167	33.3	141	28.1
I know how to access to information by using internet.	29	5.8	42	8.4	109	21.7	158	31.5	164	32.7
I like disassembling and assembling computer hardware.	77	15.3	69	13.7	148	29.5	122	24.3	86	17.1
I like spending time with computer hardware.	63	12.5	85	16.9	136	27.1	122	24.3	96	19.1
When there is a hardware problem, I try to mend computer hardware in order to understand the problem.	52	10.4	79	15.7	148	29.5	127	25.3	96	19.1
I know how to disassemble and assemble computer hardware.	92	18.3	77	15.3	135	26.9	123	24.5	75	14.9
I like enriching my presentations designed with presentation programs (Power point, Presenter, etc.) through animations.	53	10.6	59	11.8	172	34.3	127	25.3	91	18.1
When I should make a presentation to people, I use presentation programs (Powerpoint, Presenter, etc.).	38	7.6	65	12.9	151	30.1	141	28.1	107	21.3
I prefer storing data by using spreadsheet programs (Microsoft Excel, Calc etc.).	48	9.6	65	12.9	143	28.5	153	30.5	93	18.5
I use graphic and drawing programs (Paint, Photoshop, etc.) when in need	45	9.0	74	14.7	122	24.3	160	31.9	101	20.1
Instead of writing by hand, I prefer using word-processing programs (Microsoft Word, Writer etc.).	36	7.2	57	11.4	133	26.5	155	30.9	121	24.1
I believe it is necessary to check e-mail account regularly.	33	6.6	74	14.7	101	20.1	157	31.3	137	27.3
I communicate people via e-mail.	57	11.4	74	14.7	115	22.9	141	28.1	115	22.9
I communicate with people by sending text messages simultaneously on internet (via Msn, Yahoo Messenger etc.).	40	8.0	34	6.8	98	19.5	102	20.3	228	45.4

presentations designed with presentation programs (Powerpoint, Presenter, etc.) through animations.” The highest response “agree” was given by the participants to the 3rd, 4th and 10th items “Using ICT makes our life easy.”, “It is inevitable to use ICT in daily life.” and “I like searching on the Internet.” The highest response “strongly agree” was given by the participants to the 23rd item “I communicate with people by sending text messages simultaneously on the internet (via Msn, Yahoo Messenger, etc.)”

As seen in Table 4, the difference in the average score of the general tendency of the ICT subscale was statistically significant in terms of the universities where the students studied ($p < 0.05$). In the advanced analysis (LSD) performed to find which group yielded the difference, the average score of general tendency of the ICT subscale of Kafkas University was found to be lower than Ardahan University. The difference in the average score of access to information in virtual environments subscale was statistically significant according to the universities where the students studied ($p < 0.05$). In the advanced analysis (LSD) done to identify which group yielded the difference, the average score of access to information in virtual environments subscale of Kafkas University was found to be lower than Ardahan University and Iğdır University. The difference in the average score of use of software subscale was statistically significant according to the universities where the students studied ($p < 0.05$). In the advanced analysis (LSD) performed to explore which group differed, it was seen that the average score of use of software subscale of Kafkas

University was lower than Ardahan University and Iğdır University. The difference in the average score of communication in virtual environments subscale was statistically significant according to the universities where the students studied ($p < 0.05$). The advanced analysis (LSD) done to explore which group differed showed that the average scores of all universities were different from each other. The score of the students of Ardahan University was higher than the students of Iğdır and Kafkas Universities whereas the score of the students of Iğdır University was higher than those of Kafkas University.

As seen in Table 5, the difference in the average score of access to information in the virtual environments subscale was statistically significant ($p < 0.05$). In the advanced analysis (LSD) done to identify which group yielded the difference, the scores of the students of sports management were found to be higher than those of coaching education in terms of academic departments.

As seen in Table 6, the differences in the average scores of the general tendency of ICT, access to information in virtual environments, computer hardware, use of software and communication in virtual environments subscales were statistically not significant ($p > 0.05$).

As seen in Table 7, the differences in the average scores of the general tendency of ICT, access to information in virtual environments, computer hardware, use of software and communication in virtual environments subscales were statistically not significant ($p > 0.05$). (Table 8)

Table 4. Comparison of the subdimensions of ICTAS in terms of universities.

		n	Mean	SD.	Test	p
General ICT predisposition	Iğdır University	172	21.00	5.63	F=3.313	0.037
	Kafkas University	166	19.92	5.56		
	Ardahan University	164	21.49	5.80		
Accessing virtual environment information	Iğdır University	172	19.06	4.24	F=5.344	0.005
	Kafkas University	166	17.64	4.62		
	Ardahan University	164	19.02	4.74		
Computer hardware	Iğdır University	172	12.37	4.30	F=1.404	0.247
	Kafkas University	166	12.49	3.97		
	Ardahan University	164	13.08	4.10		
Use of software	Iğdır University	172	17.48	4.70	F=3.952	0.020
	Kafkas University	166	16.18	4.56		
	Ardahan University	164	17.32	4.53		
Communication in a virtual environment	Iğdır University	172	10.85	2.74	F=13.41 8	0.000
	Kafkas University	166	10.01	2.90		
	Ardahan University	164	11.64	2.96		

Table 5. Comparison of the subdimensions of ICTAS in terms of academic departments at Kafkas University.

Kafkas University		n	Mean	SD	Test	p
General tendency of ICT	Physical education and sports teaching	14	20.00	6.04	F=2.689	0.071
	Sports management	135	20.28	5.35		
	Coaching education	17	17.00	6.21		
Accessing virtual environment information	Physical education and sports teaching	14	16.00	5.45	F=3.469	0.033
	Sports management	135	18.08	4.30		
	Coaching education	17	15.47	5.67		
Computer hardware	Physical education and sports teaching	14	11.93	5.33	F=1.490	0.228
	Sports management	135	12.73	3.85		
	Coaching education	17	11.06	3.53		
Use of software	Physical education and sports teaching	14	15.21	6.14	F=0.893	0.411
	Sports management	135	16.41	4.47		
	Coaching education	17	15.18	3.76		
Communication in a virtual environment	Physical education and sports teaching	14	9.21	3.75	F=1.507	0.225
	Sports management	135	10.19	2.82		
	Coaching education	17	9.18	2.67		

Table 6. Comparison of the subdimensions of ICTAS in terms of academic departments at Ardahan University.

Ardahan University		n	Mean	SD	Test	p
General tendency of ICT	Physical education and sports teaching	84	21.26	5.75	F=0.130	0.878
	Sports management	79	21.72	5.92		
	Coaching education	1	22.00	.		
Accessing virtual environment information	Physical education and sports teaching	84	19.37	4.71	F=0.455	0.635
	Sports management	79	18.66	4.81		
	Coaching education	1	19.00	.		
Computer hardware	Physical education and sports teaching	84	12.51	4.13	F=1.887	0.155
	Sports management	79	13.71	4.01		
	Coaching education	1	11.00	.		
Use of software	Physical education and sports teaching	84	17.13	4.88	F=0.150	0.861
	Sports management	79	17.51	4.18		
	Coaching education	1	18.00	.		
Communication in a virtual environment	Physical education and sports teaching	84	11.49	2.85	F=0.262	0.770
	Sports management	79	11.81	3.10		
	Coaching education	1	11.00	.		

Table 7. Comparison of the subdimensions of ICTAS in terms of academic departments at Iğdır University.

Iğdır University		n	Mean	SD	Test	p
General tendency of ICT	Physical education and sports teaching	56	21.05	5.69	F=0.124	0.884
	Sports management	17	20.35	5.52		
	Coaching education	99	21.08	5.66		

Table 7. Continues.

Accessing virtual environment information	Physical education and sports teaching	56	18.57	4.44	F=0.603	0.548
	Sports management	17	19.59	3.71		
	Coaching education	99	19.25	4.22		
Computer hardware	Physical education and sports teaching	56	12.43	4.29	F=0.982	0.377
	Sports management	17	11.00	4.30		
	Coaching education	99	12.58	4.30		
Use of software	Physical education and sports teaching	56	17.55	4.62	F=0.043	0.958
	Sports management	17	17.71	4.16		
	Coaching education	99	17.39	4.87		
Communication in a virtual environment	Physical education and sports teaching	56	10.73	2.69	F=0.218	0.804
	Sports management	17	11.24	2.82		
	Coaching education	99	10.85	2.78		

Table 8. Comparison of the subdimensions of ICTAS in terms of income at Iğdır University.

Iğdır University		n	Mean	SD	Test	p
General tendency of ICT	I need support/scholarship	66	20.88	5.78	F=0.384	0.820
	I hardly live on my income	59	21.27	6.00		
	Moderately satisfactory	26	20.15	4.70		
	Satisfactory	14	22.29	5.76		
	Very satisfactory	7	20.43	4.65		
Access to virtual environment information	I need support/scholarship.	66	19.08	4.32	F=0.555	0.695
	I hardly live on my income.	59	19.19	4.26		
	Moderately satisfactory	26	18.88	4.23		
	Satisfactory	14	19.86	3.96		
	Very satisfactory	7	17.00	4.47		
Computer hardware	I need support/scholarship.	66	11.58	4.36	F=3.154	0.016
	I hardly live on my income.	59	12.10	4.25		
	Moderately satisfactory	26	12.77	3.93		
	Satisfactory	14	15.64	4.05		
	Very satisfactory	7	14.14	3.08		
Use of software	I need support/scholarship.	66	16.82	4.90	F=1.684	0.156
	I hardly live on my income.	59	17.92	4.85		
	Moderately satisfactory	26	16.58	4.18		
	Satisfactory	14	19.79	3.70		
	Very satisfactory	7	18.71	3.77		
Communication in a virtual environment	I need support/scholarship.	66	10.48	2.67	F=3.385	0.011
	I hardly live on my income.	59	11.36	2.80		
	Moderately satisfactory	26	9.77	2.45		
	Satisfactory	14	12.57	1.79		
	Very satisfactory	7	10.57	3.60		

DISCUSSION

In today's world, the fast technological advances in the last quarter century have made it inevitable to access information in social life, to experience changes in communication devices and to adapt to these situations. Through audio, visual and printed communication devices of information and communication technologies; we obtain numerous positive outcomes, we reach information quickly, fast communication becomes possible, productivity increases, information is easily and safely stored and time is saved.

This study was conducted to identify attitudes of the students studying physical education and sports education between 2021-2022 academic year towards information and communication technologies. Using ICTAS regarding information and communication technologies, the relevant opinions and thoughts of students studying sports education at universities were reviewed.

166 students from Kafkas University, 172 students from Iğdır University and 164 students from Ardahan University joined the study. 34.3% of the participants studied at Iğdır University, 33.1% of them at Kafkas University and 32.7% of them at Iğdır University and the study was composed of a total of 502 students. According to the data of the study; 46% of the participants studied at the department of sports management, 30.7% of them at the department of physical education and sports teaching, and 23.3% of them at the department of coaching education. 63.3% of the students that contributed to the study were male students while 36.7% of them were female students. 22.3% of the participants attended 1st grade, 16.3% of them 2nd grade, 34.1% of them 3rd grade, and 27.3% of them in 4th grade. According to our study results; 83.9% of the participants were aged between 21 and 30 years and as seen, 44.8% of the participants reported income status as "I need support/scholarship".

The scale consisted of 23 questions. The factors were classified by Günbatır (2014) under 5 subscales: the general tendency of ICT, access to information in virtual environments, computer hardware, use of software, and communication in virtual environments.

As a result of the analysis, Kaiser-Meyer-Olkin (KMO) sampling adequacy value was found as 0.926. The fact that the value was bigger than 0.50 indicated that the data were suitable for factor analysis. Also, the fact that the Barlett test was found 0.000 indicated that the significance level was sufficient for factor analysis and factor analysis could be performed. Variance values of ICTAS subscales that questioned attitudes towards information and communication technologies were examined and the subscales of "the general tendency of ICT" (15.678%) and "access to information in virtual environments" (10.321%) were found to explain variance

values the most. When examining variance values of ICTAS, the total variance was identified to be 64.288%; which meant that the subscales of the scale explained 64.288% of the analysis. Factor loading of the items ranged from 0.540 and 0.818.

Alpha values explain the reliability of the variables and the result of the analysis done to identify attitudes towards information and communication technologies showed an alpha value of 0.875 for "the general tendency of ICT", of 0.836 for "access to information in virtual environments", of 0.821 for "computer hardware", of 0.833 for "use of software" and of 0.669 for "communication in virtual environments". Alpha values of these subscales were within acceptable ranges.

Examining the participants in demographic information

36.7% of the participants were female university students whereas 63.3% of them were male university students. When ICTAS subscales at Kafkas University were compared in terms of gender, the average score of the general tendency of the ICT subscale differed statistically and significantly ($p < 0.05$). The average score of the male university students was higher. The difference in average scores of access to information in virtual environments, computer hardware, use of software and communication in virtual environments subscale were statistically not significant ($p > 0.05$).

When ICTAS subscales at Ardahan University were compared in terms of gender, it was concluded that the differences in the average scores of the general tendency of ICT, access to information in virtual environments, computer hardware, use of software and communication in virtual environments subscales were not found to statistically be significant ($p > 0.05$).

Likewise, when ICTAS subscales at Iğdır University were compared according to gender, it was noted that the differences in the average scores of the general tendency of ICT, access to information in virtual environments, computer hardware, use of software and communication in virtual environments subscales were not found to statistically be significant ($p > 0.05$).

İşıkğöz (2015) which studied the attitudes of the candidate teachers of physical education and sports towards information and communication technologies reported that male candidate teachers demonstrated higher attitudes towards computer hardware subscale. Kuş (2005) identified that self-sufficiency perceptions did not differ in terms of gender. The studies of Cambaz (1999), Ünalı (2003), Aydoğdu (2003) and Deniz (2005) which examined attitudes towards computer-assisted learning showed no difference in terms of gender Murathan (2014).

When examining the general tendency of the ICT

subscale of candidate teachers in the gender variable, no significant difference existed in their general tendency of ICT levels ($p = 0.831$). When examining mean values, female students' mean value of general tendency of the ICT subscale was $X = 3.90$ while male students' mean value was $X = 3.82$. Consequently, female students' general tendency to ICT levels was bigger than male students. In this sense, the general tendency of ICT refers to a predisposition to electronic sources and services such as computers, telecommunication devices, the internet, etc. in order to transfer, process, create, disseminate, save and manage information (Bekar, 2017).

In the current study, 421 students' age varied from 21 to 30 years; which represented 83.9% of the participants. In the study of Yaşar that examined 9th-grade students' opinions and expectations about information and communication technology course; it was found that attitudes of sending emails and searching online, which are aspects of communication in virtual environments and access to information in virtual environments subscales, were more evident; the reason of which may be resulting from the fact that ability to adapt into technological advances increases more as age-range decreases and those students aged between 17 and 20 years were more interested in information and communication technology course (Yaşar, 2013).

When ICTAS subscales at Kafkas University were compared in terms of income, it was observed that the differences in the average scores of the general tendency of ICT, access to information in virtual environments, computer hardware, use of software and communication in virtual environments subscales were statistically not significant ($p > 0.05$).

However, as for the ICTAS subscales at Ardahan University compared in terms of income, the difference in the average score of communication in virtual environments subscale was statistically significant ($p < 0.05$). In the advanced analysis (LSD) performed to understand which group caused the difference, scores of those who answered the question "moderately satisfactory" were lower than those who responded "I need support/scholarship" and "I hardly live on my income". Yet, the differences in the average scores of the general tendency of ICT, access to information in virtual environments, computer hardware and use of software subscales were not statistically significant ($p > 0.05$).

As for the comparisons of ICTAS subscales at Iğdir University in terms of income, the difference in average scores of computer hardware and communication in virtual environments subscales were found to statistically be significant ($p < 0.05$).

In the advanced analysis (LSD) of the computer hardware subscale done to determine which group caused the difference, the scores of those who answered the question "satisfactory" were higher than those who

responded "I need support/scholarship", "I hardly live on my income" and "moderately satisfactory".

In the advanced analysis (LSD) of communication in virtual environments subscale done to determine which group caused the difference, the scores of those who answered the question "satisfactory" were higher than those who responded "I need support/scholarship" and "moderately satisfactory".

On the other hand; the differences in average scores of the general tendency of ICT, access to information in virtual environments and use of software subscales were statistically not significant ($p > 0.05$).

In a study, income level and attitudes towards information and communication technologies were studied and a significant difference existed between the use of software subscale and income level. Moreover; it might be concluded that as income level increased, students' attitudes towards the use of software subscale became higher than those students with lower income levels. This may be correlated with purchasing power for information and communication technologies (Şimşek, 2018).

When examining the results of another study, it was underlined that as family income level increased, so did the level of use of software even if there was no significant difference. Family income level facilitates one's access to technology; people use technological solutions and do not have difficulty perceiving. Thus, people can make their life easier by using software solutions instead of classical and time-consuming solutions. Similar results have been obtained in previous studies, too. (Bekar, 2017).

Comparisons of ICTAS subscales at Kafkas University in terms of academic departments

the difference in the average score of access to information in virtual environments subscale was statistically significant in terms of academic departments ($p < 0.05$). In the advanced analysis (LSD) performed to find which group yielded the difference, the average scores of the students at the Department of sports management were higher than those at the Department of coaching education program.

However, the differences in the average scores of the general tendency of ICT, computer hardware, use of software and communication in virtual environments subscales were statistically not significant ($p > 0.05$).

Comparisons of ICTAS subscales in terms of universities

the difference in the average score of the general tendency of the ICT subscale was statistically significant

in terms of universities where the students studied ($p < 0.05$). In the advanced analysis (LSD) conducted to determine which group caused the difference, the score of the general tendency of ICT at Kafkas University was found to be smaller than at Ardahan University. The difference in the average score of access to information in virtual environments subscale was statistically significant according to the universities ($p < 0.05$). In the advanced analysis (LSD) conducted to explore which group gave the difference, the score of access to information in virtual environments at Kafkas University was smaller than Ardahan and Iğdır Universities.

The average score of use of software subscale differed statistically and significantly according to the universities where the students studied ($p < 0.05$). The advanced analysis (LSD) conducted to determine which group caused the difference demonstrated that the score of use of the software at Kafkas University was lower than those of Ardahan and Iğdır Universities.

The average score of communication in virtual environments subscale differed statistically and significantly according to the universities where the students studied ($p < 0.05$). The advanced analysis (LSD) performed to understand which group caused the difference demonstrated that the scores of all of the universities were different from each other. The score of Ardahan University was higher than the scores of the students at Iğdır and Kafkas Universities while the score of the students at Iğdır University was bigger than the students of Kafkas University.

Examining the attitudes of university students who studied sports education toward information and communication technologies

The highest response “strongly disagree” was given by the participants to the 15th item “I can disassemble and assemble a computer.” The highest response “disagree” was given by the participants to the 13th item “I enjoy handling the components of a computer.” The highest response “neutral” was given by the participants to the 16th item “I like enriching my presentations designed with presentation programs (Powerpoint, Presenter, etc.) through animations.” The highest response “agree” was given by the participants to the 3rd, 4th and 10th items “Using ICT makes our life easy.”, “It is inevitable to use ICT in daily life.” and “I like searching on the Internet.” The highest response “strongly agree” was given by the participants to the 23rd item “I communicate with people by sending text messages simultaneously on the internet (via Msn, Yahoo Messenger, etc.).”

University students who received education in physical education and sports had positive attitudes towards information and communication technologies and the subdimensions of the general tendency of ICT, access to

information in virtual environments, use of software, and communication in virtual environments, whereas it was noted that their attitudes towards computer hardware subscale were lower.

In the study of Şimşek (2018) and Yirci and Aydoğar (2017), in which university students' attitudes towards information and communication technologies were investigated in terms of some variables, it was seen that their attitudes towards the subdimensions of the general tendency of ICT, access to information in virtual environments, use of software, communication in virtual environments were positive while their attitudes towards computer hardware subscale were low; the reason of which may be that they use computers for only accessing to information as a part of consumption economy rather than dealing with computer hardware.

The study of Dinçer and Şahinkaya (2011) which was done with 440 university students on ICT competency reported that 89.01% of the students were highly computer literate. In the study of Yurdakul (2011), the level of ICT use of 1.2% of the candidate teachers was low, the level of ICT use of 45% of them was moderate and the level of ICT use of 52.8% of them was high (Bekar, 2017).

ICT knowledge and skills play a key role in the educational activities of our education system. Since information and communication technologies have widely been used, particularly, in higher education, the studies done indicated that university students' ICT skills are generally high. In light of these results, it may be argued that it is necessary and important to adapt technology into, particularly, higher education. On the other hand, studies conducted to understand whether or not behavioral changes obtained through physical education, sportive activities and games can be transferred to one's general experiences demonstrated that behaviors obtained in physical and psycho-social fields through physical activities are transferred to similar and necessary situations in daily life. In the study of Tepeköylü et al. (2009) done with physical education and sports students, it was underlined that these students' communication skill perceptions are quite high. Tepeköylü et al. (2009) linked this result with the fact that 88.9% of the study group played sports regularly on elite and school team levels and as a leisure time activity while the rest (11.1%) only had a history of sports. The study by Arslan et al. (2016) stated that students who played sports amateur and professionally were more extroverted than those who did not play sports actively. It is suggested that the psycho-social behaviors obtained help those playing sports communicate more easily.

In light of the general results of this study, the attitudes of the students who study in different departments and the attitudes of the students who study at different universities can be compared. By expanding the sample group, all of the students studying physical education and

sports in Turkey can be compared in terms of ICT characteristics and variables. It is necessary to hold acquaintance meetings, discussion meetings, panels and organizations in which students' academic knowledge about teaching, sports management and coaching professions can be increased. In order to enhance attitudes of the students who receive sports education towards information and communication technologies; academic courses that include technological devices, necessary knowledge and skills should be emphasized and focused.

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Citation: Karahan, M. B., and Kaya, O. (2023). Determination of information and communication technologies attitudes of university students that received physical education and sports. *African Educational Research Journal*, 11(2): 191-201.
