

Critical Thinking Disposition of the Students Studying Sport Science at University

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ABSTRACT The aim of this research is to examine whether the critical thinking disposition of the students studying at university changes or not according to the variables. The sample group of research consist of students who are both active athlete in 2013-2014 academic year and who continued their education at Ankara university. In order to measure the students' critical thinking disposition, the California Critical Thinking Disposition Inventory (CCTDI) developed by Facione and his colleagues and adapted to Turkish by Kokdemir was used. The data showed normal distribution when assessed by Levene test. As a result, it has been identified that students critical thinking levels didn't change by sex, but the critical thinking levels of sport students who are studying in other faculties and academies are higher than those who are studying in SPES. Moreover, the critical thinking levels of students who have spent up to 1-3 and 4-6 years were lower than those who have spent up to 7 years and above.

INTRODUCTION

Individuals' adapt to innovation in social life easily, using acquired rights to develop critical thinking skill which plays an important role in understanding of today's modern education. With contemporary education, it is intended to grow individuals who are versatile, productive, investigating, inquisitive, skeptical and who can face situations with new information (Tural and Secgin 2012). When the education is thought as an important process in human life, rather than growing up individuals who accept the information without questioning, the need of new knowledge-producing skilled manpower who know what and how to use and also develop the information learned has increased importance (Ozturk and Ulusoy 2008). Skilled people perceive each moment and can think critically according to Chaffee (1994) critical thinking which is defined as active, organized and mental process for which we can understand and explain our own ideas and that of others (Kokdemir 2003). According to Chun (2010), critical thinking is reliable kind of thinking which occurs at analysing and solving the facts. In a related literature, emphasis was

made on the fact that individuals who encounter uncertainty situations and events are more relevant and fair from the point of critical thinking. They can also empathize and overcome the problems they faced as well as produce clear solutions, it is also observed that growing up individuals who debate a lot compromises culture (Demircioglu 2012; Demirel 2002; Dutoglu and Tuncel 2008).

Based on the initial descriptions, thinking is to understand situations that existed primarily, determine the relationship between them and finally make sense of them.

Although critical thinking skills are often studied by social scientists, it has been the subject of sports scientists recently. The reason for this is the expected outcome of sports training and critical thinking skills. Because critical thinking skills have an important function in making decision, developing strategy, reduction of various possibilities, alternative generation, being creative and producing responsibility facilities (Certeel et al. 2011; Gencay 2009; Sacli 2008; Sacli and Demirhan 2008; Tekin and Filiz 2008; Tekin and Filiz 2009). In this sense, the development of critical thinking skills of sport students of universities will expose them to innovation and inquiry-based active sport approach. Moreover, independent decision making, establishing cause and effect relationship to the problems faced, accelerating the process of thought and interpreting conditions are thought to be necessary in the recovery of intellectual capabilities (Kokdemir

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2003). The lack of critical thinking skills in students studying at university may adversely affect their success and athletic performance quality, effectiveness and adequacy, and the chance of being a senior. For this reason, athletes who have a good level of critical thinking skills and who protect sporty performance values can effectively develop and enhance the quality of life. However, the aim of this study is to determine critical thinking levels of sport students at university.

METHODOLOGY

Research Model

This study, tried to determine whether the critical thinking level of sport students at university varies according to the individual variables and so the relevant sources has been scanned. Therefore, organized research screening model has a descriptive background.

The Research and Sample

The universe of the research consists of 2800 university students who participated in the sports contests organized by Ankara University in 2013-2014 academic year and intercollegiate contests. The sample group of this study consists of 203 randomly selected sport students continuing their education at Ankara University in 2013-2014 academic year.

Data Collection Tool

California Critical Thinking Disposition Inventory (CCTDI) : This scale emerged as a result of Delphin Project organized by the American Philosophy Association in 1990. The study of the adoption of this scale to Turkish was conducted on 913 students by Kokdemir. Item-total correlation and principal components analysis was reduced from 75 items to 51 items, and from 7 sizes to 6 sizes. The new sub-dimensions of the scale internal consistency (alpha) ranged between 0.61 and 0.78, but the scale's internal consistency coefficient was 0.88. Total variance explained by the scale is determined as 36.13 percent. Each item is ranked by using 5 interval scale ranging from "strongly agree" to "strongly disagree".

Used as a data collection tool (CCTDI) consisting of 51 items is a 5 point Likert-type scale

and the given scales are based on each item. However, negative items (5, 6, 9, 11, 15, 18, 19, 20, 21, 22, 23, 25, 27, 28, 33, 36, 41, 43, 45, 47, 49, 50) are pointed in reverse direction. In the assessment of CCTDI, according to the participating students', the given items are collected and their results are assessed out of 306 points. In terms of scores, it is accepted that those who get 240 points and below scored low, those between 240-300 points have middle score, while those with 300 and above points scored high and therefore have higher critical thinking skills.

The original size of scale is as follows:

In order to determine the reliability of the scale, Cronbach's alpha reliability coefficient was determined as 0.912. Meanwhile, 0.80 and above scales are highly reliable scales (Kalayci 2009). In this case, the entire scale can be highly trusted. In addition, all aspects are also seen to have a high degree of reliability.

Data Analysis

Personal information and the scores taken from California Critical Thinking Disposition Inventory of students who participated in the study were analyzed by frequency, pertance and the arithmetic mean. The research shows a normal distribution of data when it is analyzed with the Levene test. Since the data showed normal distribution, the level to which participants' opinions differ by gender were examined using the unrelated t-test. Whether the participants have different opinions or not according to their sport year and education was determined by one-way analysis of variance. In the groups who showed the difference in one way analysis of variance, LSD test was applied to find the group. SPSS 16.0 statistical software package was used in the analysis of the collected data, but the study and margin of error was accepted as 0.05

FINDINGS

The personal information of university students is shown in Table 1.

With reference to Table 1, it has been identified that the students who participated in the research consist 36.9 percent of girls and 63.1 percent of boys. Regarding the number of years the students' have been doing sport, it has been observed that 8.9 percent have 1-3 years, 67 percent have 7 years and above. In addition, it

Table 1: Personal information of the students who participated in the research

Personal information	Subgroups	(f)	(%)
Gender	Female	75	36.9
	Male	128	63.1
	Total	203	100.0
Sport Experience	1-3	18	8.9
	4-6	49	24.1
	+7	136	67.0
	Total	203	100.0
Educational Status	SPES-Sport Science Faculty Students	138	68.0
	Other Faculty and College Students	65	32.0
	Total	203	100.0
	School of Physical Education and Sport – (SPES)		

was determined that 68 percent of the students are studying at PES, while 32 percent of them are studying in other faculties and schools.

As seen in Table 2, the critical thinking dispositions which sport students gained from the sub-scale arithmetic mean values do not differ too much. After the examination of the Table, the sub-scales showed that the highest average of the sport students was in the area of self confidence (= 38.81) while the lowest average was in the area of curiosity. In addition to this, the athletes obtained = a total of 209.82 points. This value shows that they have low tendency to think critically in terms of total points.

Table 2: Sport students' critical thinking disposition mean scores on the sub-scales

Sub-scale	\bar{X}	SS
Analyticalness	34.12	6.31
Open- mindedness	38.57	5.02
Curiousness	23.79	4.39
Self-confidence	38.81	4.87
Search for truth	37.39	5.77
Systematicity	37.14	5.98
Total	209.82	32.34

(N=203)

In Table 3, the total points on the Critical Thinking Level of the students who participated in the study was not observed to be statisti-

cally significant difference as a result of t-test. [t(203) = .393; p>.05].

Table 3: According to the gender t- test analysis results of students who participate in the study

Level of critical thinking	Gender	x	S	t	P*
	F	146.53	3.88	.393	.695
	M	146.29	4.27		

p* < .05 Sd: 201 N_{Male} = 128 N_{Female} = 75 N_{Total} = 203

In Table 4, the significant difference was used to find the total score of students' opinion according to their faculties as a result of t-test analysis.

As seen in Table 5, the total score of the critical thinking of students who do sports was found to have a positive difference in the average level of 0.05 as a result of analysis of variance.

Participant students who have up to 1-3 yearssport experience have gained a total of 145.46 points from CCTDI, those who have sport experience for 4-6 years have gained 147.89 points while the others who have 7 years and above sport experience gained 147.89 points. This total score shows that students have low CCTDI.

Table 4: t- test analysis results of participant students according to their faculties

Critical Thinking Level	Faculties	X	S	t	P*
	School of Physical Education and Sport – (SPES)	145.92	4.286	-2.178	.031*
	Other Faculties and Academies	147.25	3.657		

p* < .05 Sd: 201 N_{Male} = 128 N_{Female} = 75 N_{Total} = 203

Table 5: Participant students' one-way analysis of variance results according to their sedentary years

<i>Critical Thinking Level</i>	<i>Homogeneity LS</i>	<i>P</i>	<i>Groups</i>	<i>X</i>	<i>Sd</i>	<i>F</i>	<i>P*</i>	<i>Difference</i>
	2.947	.055	1-3	145.46	2022002	11.62	.000*	1-3 years, 4-6 years >7years ve above

$P^* < .05$ $N_{1-3 \text{ years}} = 18$ $N_{4-6 \text{ years}} = 49$ $N_{\text{year and above}} = 136$ $N_{\text{Total}} = 203$

DISCUSSION

The aim of this research examined the critical thinking disposition of the results. The results obtained by studying athletes among university students in general shows that they tend to have a low level of critical thinking. The trend in critical thinking; analytical, open mindedness, interestedness, self-confidence, search for truth and systematicity in sport is important for the students in lower dimension which has not been identified in the expected level of critical thinking tendency.

As seen in Table 2, 'sport students' critical thinking dispositions doesn't differ too much from their gained scores of sub-scale arithmetic mean values. The study shows that students' self confidence sub-scale is the highest, while their curiousness is the lowest. In the study, the students have obtained the highest score in self confidence sub-scale while they have the lowest score in the curiousness sub-scale. That the students had taken the lowest score from curiousness sunscale can be interpreted as learning new things without any gain or expectations from the inter-university competitions (Tural and Secgin 2012). This study also considers low curiosity points of the students who should have the qualities such as learning new techniques, establishing cause and effect relationships for competitions. On the other hand, it is a noteworthy indication that the total score of students' critical thinking disposition has been in low level. It can be said that this low level score arises from the relationship between the instructor and the student, and the students' characteristics. It is available in the literature that the critical thinking dispositions of the participants are low just like in similar studies (Akkus et al. 2010; Arslan et al. 2009; Atay et al. 2009; Cetinkaya 2011; Genc 2008; Öztürk and Ulusoy 2008; Tekin and Filiz 2009; Kucuk and Uzun 2013). In contrast,

there are some studies that have a high level of critical thinking disposition in the literature. (Ay and Akgöl 2008; Beser and Kissal 2009). According to these data, it can be said that critical thinking skills is a mechanism which can change according to the process of vocational education, sports experience, personality characteristics, and the demographic characteristics of the sample. Therefore, the survey data reveals that critical thinking dispositions have been affected by several variables.

In Table 3, it has been identified that male participant students have 146.53 total points and the female participant students have 146.29 total points. Female and male students' critical thinking levels are similar, but these total scores are classified as low according to CCTDI. Statistically, the difference of the students' critical thinking level as a result of t-test analysis is very important [$t(203) = .393$; $p > .05$]. According to this result, it can be stated that gender has no important effect on the critical thinking level. This result shows parallelism with the study which shows that gender has no important effect on the critical thinking level by Çaliskan (2009), Ekinici and Aybek (2010), Karali (2012), Kawashima and Shiomi (2007), Korkmaz (2009), Kanbay and et al. (2012), Sacli and Demirhan (2008), Narin (2009), Sen (2009), Tural and Secgin (2012), Tumkaya (2011), Yuva (2011), Ersan and Guney (2012). However, there are also studies which show that there is a significant difference in favor of boy sor girls in terms of critical thinking level. (Besoluk and Önder 2010; Cetinkaya 2011; Tumkaya 2011). Critical thinking is influenced by many factors in addition to gender, and closeness of ages to each other which inevitably affects the final outcome.

In Table 4, a significant difference was identified on total opinion score of the participating students as a result of t-test analysis. [$t(203) = -2.178$; $p < .05$]. The critical thinking level of the students who are studying at other faculties and

academies is higher than those who are studying at School of Physical Education and Sport (SPES)

These total scores are classified as a low critical thinking level according to CCTDI. The findings of this research, suggest that the students at School of Physical Education and Sport– (SPES) haven't become skillful at critical thinking.

A related literature has stated that students' critical thinking skill are affected by inborn features, family structure, their parents' educational and socio-economic level, the environment, teacher attitude, physical condition, nutrition, sleep, rest time, age, developmental level, gender, beliefs, environmental factors and so on. (Erkus 2011; Yucel and Kocak 2010; Gulec 2010). Together with the general factors affecting critical thinking; thoughts, decisions, those kind of upbringing an environment which gives an opportunity to criticise the judgements and decisions, instructor's attitude which doesn't have developing quality, the use of non improving techniques and methods, culture and language deficiencies can be specified as affecting factors of critical thinking (Sacli 2008; Sacli and Demirhan 2008; Tekin and Filiz 2008; Tekin and Filiz 2009). Gulveren (2007) has observed that the critical thinking skill of students studying at department of early childhood education are more successful than those who are studying at other faculties. Ricketts and Rudd (2004) have expressed that critical thinking skills of the students in different sections differ from their opinions and there have been important differences between agricultural students and non-agricultural students. The findings of this study show parallelism with this study in this context.

As seen in Table 5, the total score of the critical thinking of students who do sports was found to have a positive difference in the average level of 0.05 as a result of analysis of variance [$F(2; 202) = 11,62; p < .05$]. LSD test was used to find out what caused a significant difference from the group, since there have been a significant difference between those who have spent 1-3 years, 4-6 years, 7 years and above in sports judoka. The Critical Thinking Levels of students who are involved in sports between 1-3 years and 4-6 years are lower than 7 years and above. The students who improved in their critical thinking skill in education and sports life can

be assumed to be adequate, effective and creative to various problems.

Having a tendency to search for the truth, to be able to evaluate different ideas objectively, accepting the thoughts even if they conflict with his own ideas are important for an athlete (Tural and Secgin, 2012). In literature, there are also studies which indicate the significant differences as a result of knowledge and social experience, as well as adaptation to new environment by increasing school years (Ay and Akgol 2008; Durmus 2012; Emir 2012; Karali 2012; Tekin and Filiz 2008; Ay 2006). However, there are studies indicating that there is no association between class or year of the study and critical thinking skills (Arslan et al. 2009; Gencay 2009; Gurol and et al. 2013). Searching for knowledge and adaptation to new environment by the new students are thought to be the causes of these results.

CONCLUSION

Consequently, it has been identified that students' critical thinking levels did not differ by sex, but critical thinking levels of athletes who are studying in other faculties and academies are higher than that of those studying in (SPES) it was identified that the critical thinking levels of students engaged in sports between 1-3 and 4-6 years were lower than that of those who have been in the game for 7 years and above. This data shows that university athletic students have low levels of critical thinking.

RECOMMENDATIONS

Based on the results of the study on sport education in high school, universities or faculties, student of sports should develop positive trends in giving into a critical thinking lesson, partake in programs that are related to the application of critical thinking in current lessons and activities. Critical thinking disposition to raise the level of regulation of activity of the group for guidance is also recommended. Studying in the field of sport science sports scientist candidates critical thinking; analytical, open-mindedness, interestedness, self-confidence, search for truth and systematicity such as search systematic relations of variables to investigate new studies can be done. In addition, the universities sports teaching faculty or college programs should tend

to impact critical thinking developers in the analysis of experimental studies.

LIMITATIONS

This study is limited to Ankara University sport students. Accordingly, the study group of this study is limited to 203 sport students who continued their education at Ankara University in 2013-2014 academic year.

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