

The Relationship between Academic Self-Efficacy and Cognitive Flexibility: Physical Education and Sports Teacher Candidates

La relación entre la autoeficacia académica y la flexibilidad cognitiva: candidatos a maestros de educación física y deportes

Şirin Pepe

The Ministry of National Education, Zeki Altındağ Secondary School, Selçuklu, Konya-Turkey

ORCID ID: <https://orcid.org/0000-0001-6062-8172>

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*Correspondence

Email: sirinpepe@hotmail.com

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Summary

The aim of this study is to examine the relationship between academic self-efficacy and cognitive flexibility levels of physical education and sports teacher candidates. The universe of the study consisted of 480 teacher candidates studying in the physical education and sports teaching departments of the sports sciences faculties within Selçuk, Erciyes, Süleyman Demirel and Mehmet Akif Ersoy Universities, and the sample group consisted of 192 volunteers from the specified population. Participants in the study were asked to fill in a personal information form, academic self-efficacy and cognitive flexibility scales. IBM SPSS 22.0 (Statistical Package for the Social Sciences) statistical package program was used to analyze the data. Arithmetic means and standard deviations of the scores of the volunteers from the scales were presented as $X \pm Sd$. Pearson Product Moment Correlation Analysis was applied to reveal the relationship of the data obtained from the scales. The value of $p < 0,05$ was considered significant. As a result, it was determined that the academic self-efficacy and cognitive flexibility levels of physical education and sports teacher candidates were above average. A moderate positive correlation was found between academic self-efficacy and alternatives and control subtitles of cognitive flexibility and total of cognitive flexibility. It is thought that this situation is due to the ability of physical education and sports teacher candidates to transfer their experiences in sports life to their education life.

Keywords: Physical Education and Sports, Academic Self-efficacy, Cognitive Flexibility.

Resumen

El objetivo de este estudio es examinar la relación entre la autoeficacia académica y los niveles de flexibilidad cognitiva de los candidatos a profesores de educación física y deportes. El universo del estudio consistió en 480 candidatos a maestros que estudian en los departamentos de enseñanza de educación física y deportes de las facultades de ciencias del deporte dentro de las universidades de Selçuk, Erciyes, Süleyman Demirel y Mehmet Akif Ersoy, y el grupo de muestra consistió en 192 voluntarios de la población especificada. Se pidió a los participantes del estudio que cumplimentaran un formulario de información personal, escalas de autoeficacia académica y flexibilidad cognitiva. Se utilizó el programa de paquete estadístico IBM SPSS 22.0 (Statistical Package for the Social Sciences) para analizar los datos. Las medias aritméticas y las desviaciones estándar de las puntuaciones de los voluntarios de las escalas se presentaron como $X \pm Sd$. Se aplicó el Análisis de Correlación Momento del Producto de Pearson para revelar la relación de los datos obtenidos de las escalas. Se consideró significativo el valor de $p < 0,05$. Como resultado, se determinó que los niveles de autoeficacia académica y flexibilidad cognitiva de los candidatos a maestros de educación física y deportes estaban por encima del promedio. Se encontró una correlación positiva moderada entre la autoeficacia académica y las alternativas y subtítulos de control de flexibilidad cognitiva y total de flexibilidad cognitiva. Se piensa que esta situación se debe a la capacidad de los aspirantes a profesores de educación física y deporte para trasladar sus experiencias en la vida deportiva a su vida educativa.

Palabras clave: Educación Física y Deporte, Autoeficacia académica, Flexibilidad cognitiva.

Introduction

Today, there are changes that are getting faster in all areas of life. The key role in reflecting these rapid changes to the system is education. Especially university education is a very critical stage in terms of academic success that affects individuals throughout their lives and transfers their success to the later stages of their lives (Akinci, 2020). At this stage, it is known that individuals' self-efficacy is very important for reaching predetermined goals or for solving problems they encounter in the process of achieving them.

Bandura (1997) defines the concept of self-efficacy as “personal belief in the ability of the person to plan and carry out the actions necessary in the process of achieving the determined goals”, in

other words, the individual's belief in his competencies and potential. The concept of academic self-efficacy can be defined as the perception that an individual can fulfill a certain academic task and responsibility at a certain level of success (Frozen et al, 2017). According to another definition, academic self-efficacy is related to an individual's motivation, academic choices and success (Pajares, 1996).

Individuals may face various problems both during their education and in different periods of their daily lives. They may have to decide and make a choice in the face of these problems. These types of situations are known to strengthen individuals' need to be cognitively flexible.

Individuals face two main challenges as a result of a constantly changing environment. The first of these challenges is to continue pursuing goals despite distraction; the second one is to be flexible in the change of goals and prior knowledge (in memory) in order to respond logically to environmental variables (Dreisbach, and Goschke, 2004). Deak (2003) stated that cognitive flexibility is a distinctive feature of human intelligence. In addition, he defined cognitive flexibility as the ability to adapt to unknown and unexpected situations, to create new meanings about this new situation, and to create new representations by creatively synthesizing new information and using known knowledge and habits (Deak, 2003).

In the literature review made by the researcher; studies examining the subjects of general/academic self-efficacy in different sample groups (Aydın, 2014; Caba and Pekel, 2017; Turan et al, 2016; Saracaloğlu et al, 2017; Bell and Kozłowski, 2002, Dalbudak and Musa, 2019, Yılmaz et al, 2020) and cognitive flexibility (Erdogan, 2018; Alper and Deryakulu, 2008; Aslan, 2018; Dalkılıç 2017, Canas et al, 2003; Hamtiaux and Houssemand, 2012; Kim and Omizo, 2005; Dril, 2011) has been observed. However, any study examining these two concepts of physical education and sports teacher candidates has not been found. The aim of this study is to examine the relationship between academic self-efficacy and cognitive flexibility of physical education and sports teacher candidates.

Methodology

In the study, a method for descriptive survey (survey) and relational survey aiming to reveal the current situation was used. Descriptive scanning models are a research approach that aims to describe a past or present situation as it exists. The event, individual or object that is subject to research is tried to be defined in its own conditions and as it is. No effort is made to change or influence them in any way. On the other hand, relational survey models are research models that aim to determine the presence and/or degree of change between two or more variables (Karasar 2004).

Selection of Volunteer Groups

The universe of the study consisted of 480 teacher candidates studying in the physical education and sports teaching departments of the sports sciences faculties of Selçuk, Erciyes, Süleyman Demirel and Mehmet Akif Ersoy Universities, and the sample group consisted of 192 volunteers from the specified population.

Data Collection Tools

It was prepared by using the Google Forms platform to collect data. This method was preferred in order to maintain social distance during the pandemic process. During the data collection process, information and questionnaires about the study were communicated to the participants through social networks. The physical education and sports teacher candidates participating in the study were asked to fill in the personal information form, academic self-efficacy and cognitive flexibility scales.

Personal Information Form

Physical education teacher candidates participating in the study were asked to fill in a five-question personal information form covering age, gender, university they studied, overall

academic grade point average, and weekly study time. The responses of the participants to the personal information form were presented in Table 1.

Table 1. Descriptive Statistics of Participants

	Variables	n	%
Gender	Male	126	65.6
	Female	66	34.4
	Total	192	100
Age	18-20	110	57.3
	21-23	56	29.2
	24 and above	26	13.5
	Total	192	100
General Academic Grade Point Average	0-1,99 (Low)	9	4.6
	2,00-2,99 (Medium)	94	49.0
	3,00-4,00 (High)	89	46.4
	Total	192	100
University	Süleyman Demirel	42	21.9
	Erciyes	53	27.6
	Selçuk	56	29.2
	Mehmet Akif Ersoy	41	21.4
	Total	192	100
Weekly Study Time	1-5	120	62.5
	6-10	50	26.0
	11 and above	22	11.5
	Total	192	100

When Table 1 was examined, it was seen that 65.6% of the participants are male, 34.4% of them are female; according to age variable 57.3% of them are 18-20, 29.2% of them are 21-23 and 13.5% of them are 24 years and above; according to general academic grade point average variable, 4.6% of them was low, 49% of them was medium and 46.4% of them was high; according to the university variable, 21.9% of them was Süleyman Demirel, 27.6% of them Erciyes, 29.2% of them Selçuk and 21.4% of them Mehmet Akif Ersoy; according to weekly study time, 62.5% of them were 1-5, 26.0% of them were 6-10 and 11.5% of them were 11 hours or more.

Academic Self-Efficacy Scale:

Academic Self-efficacy Scale, adapted from Jerusalem & Schwarzer (1981) consists of 7 items. It was evaluated by the relevant experts in terms of the suitability for Turkish, content and assessment. In order to determine the validity and reliability of the scale, which was prepared in line with the opinions received, it was piloted by Yılmaz et al. (2007). As a result of the factor analysis, it was determined that the scale, which was adapted to Turkish, was one-dimensional, just like the original one. Cronbach Alpha internal consistency coefficient for the reliability of the scale was calculated as .79.

Cognitive Flexibility Inventory:

Cognitive Flexibility scale, developed by Dennis and Vander Wal (2010) and adapted to Turkish by Sapmaz and Doğan (2013) was used. The Cognitive Flexibility Inventory is a 5-point Likert type with 20 questions and consists of two sub-dimensions: “control” and “alternatives”. While the questions numbered 1, 3, 5, 6, 8, 10, 12, 13, 14, 16, 18, 19 and 20 of the scale constitute the “Alternatives” dimension, the questions numbered 2, 4, 7, 9, 11, 15 and 17 constitute the “Control” dimension. Three different scores can be obtained in total in the control sub-dimension and alternatives sub-dimension of the scale. The high scores show the high cognitive flexibility.

In the adaptation study of the scale to Turkish, the Cronbach Alpha reliability coefficients were found to be 0.90 for the whole scale; 0.84 for the “control” sub-dimension and 0.90 for the “alternatives” sub-dimension (Sapmaz and Doğan, 2013).

Statistical analysis

After checking the prerequisites for normality of variables and homogeneity of variances, Kolmogorov-Smirnov test was evaluated. Kolmogorov-Smirnov test is one of the methods used to examine the normality states of the data obtained in the study, and the skewness-kurtosis distributions were given in Table 2.

Table 2. The Skewness-Kurtosis and Kolmogorov-Smirnov Test Significance Level Results of Scale Scores

	n	Skewness	Kurtosis	p
Academic Self-Efficacy	192	-.315	-.460	.000
Alternatives	192	.858	.251	.000
Control	192	.648	-.382	.000
Cognitive Flexibility Total	192	.844	.085	.000

When the Kolmogorov-Smirnov Test results were examined in Table 2, it was observed that the deviations from normality of the scores obtained from the participants' academic self-efficacy and cognitive flexibility scales were found to be significant. On the other hand, Büyüköztürk interpreted the fact that these values are in the range of ± 1 as there is no excessive deviations from normality (Büyüköztürk, 2007). Similarly, George and Mellery (2016) stated that the kurtosis and skewness coefficients between ± 1 could be accepted. In the light of this information, it was accepted that the data showed a normal distribution.

IBM SPSS (Statistical Package for the Social Sciences) 22 statistical package program was used to analyze the data. The arithmetic mean and standard deviation of the scores of the participants in the academic self-efficacy and cognitive flexibility scales presented as $X \pm Sd$. Pearson Product Moment Correlation Analysis was applied to reveal the relationship of the data obtained from the scales. The value of $p < 0.05$ was considered significant.

Results

Table 3 Descriptive Statistics of Participants' Scores Obtained from Academic Self-Efficacy and Cognitive Flexibility Scales

	n	Min	Max	X \pm SD
Academic Self-Efficacy	192	14.00	28.00	22.224 \pm 3.400
Alternatives	192	38.00	65.00	48.333 \pm 7.098
Control	192	21.00	35.00	27.589 \pm 3.553
Cognitive Flexibility Total	192	61.00	100.00	75.922 \pm 10.407

When Table 3 was examined, it was found that the academic self-efficacy levels of the physical education and sports teacher candidates were 22.224 \pm 3.400. When their cognitive flexibility was examined, it was found that alternatives sub-dimension was 48.333 \pm 7.098 control sub-dimension was 27.589 \pm 3.553 and the total cognitive flexibility levels were 75.922 \pm 10.407.

Table 4 Relationship Between Academic Self-Efficacy and Cognitive Flexibility Levels of Participants

	Alternatives	Control	Cognitive Total	Flexibility
Academic Self-Efficacy	r .391	.395	.401	
	p .000	.000	.000	

When Table 4 was examined, A moderate positive correlation was found between the academic self-efficacy and cognitive flexibility alternatives ($r=.391$, $p=.000$) and control ($r=.395$, $p=.000$) sub-dimensions and cognitive flexibility totals ($r=.401$, $p=.000$) of physical education and sports teacher candidates.

Discussions and Conclusion

In order to become an information society, each individual need to have strong self-efficacy, be researcher, and improve him/her continuously. In order to provide these competencies to individuals, first of all, the educators who will train them must have these characteristics. It is thought that the academic self-efficacy of the educators who will set an example for the individuals should be strong in order to develop themselves academically.

In this study, it was determined that the self-efficacy, cognitive flexibility total scores and sub-dimensions of the physical education and question teacher candidates were above the average (Table 3).

Bandura (1994) stated that many factors affect self-efficacy. First of all, he stated that the first factors affected are individuals' conceptual or analytical thinking abilities. It was stated that individuals with high self-efficacy beliefs also have high cognitive flexibility. (Martin and Rubin, 1995). Individuals who state that they are cognitively flexible are also stated to be very self-confident and see themselves as ready-made, careful, and understanding (Martin and Anderson 1996; Martin and Anderson 1998). In this study, it can be thought that the reason why the academic self-efficacy and cognitive flexibility levels of physical education and sports teacher candidates are above average is because of the feature that the sports branches they are engaged in provides them.

A moderate positive correlation was found between the alternatives, control sub-dimensions and cognitive flexibility total of the academic self-efficacy and cognitive flexibility of physical education and sports teacher candidates (Table 4).

In the literature review made by the researcher, it was observed that there are studies supporting that self-efficacy is associated with academic motivation (Alemdağ et al, 2014) academic success (Koca and Dadandı, 2019), performance approach orientation (Bell and Kozlowski, 2002) academic achievement goal orientation (Aydin 2014) and athlete identity perception (Caba and Pekel, 2017). Similarly, the studies reporting the relationship between cognitive flexibility, sense of humor (Kolburan et al, 2019), attitude towards social media use (Peker and Çukadar, 2016), social problem solving style (Buğa et al, 2018), stress (Turan et al, 2019), academic, emotional and social competence (Çelikkaleli, 2014) and personality characteristics (Bilgin 201) were encountered.

Academic self-efficacy is defined as the perception that an individual can do an academic task at the level of determined success (Ekinci, 2011). Within the scope of self-efficacy, in order to demonstrate and produce a skill or success in performing a given task, the individual has beliefs about the abilities and skills in organizing and achieving or performing the way of behaviour or actions required (Totan et al, 2010). It has been stated that those with high self-efficacy will choose more difficult goals, maintain their analytical thinking skills, and complete the assigned tasks on time and successfully (Aşkar and Umay, 2001). The individual's self-efficacy or ability to be flexible, as well as awareness of alternative ways and options, willingness to be flexible and adapt to situations are expressed as three basic elements of cognitive flexibility (Martin and Anderson, 1998). Individuals with cognitive flexibility are aware of options, can effectively deal with new and difficult situations, produce alternative thoughts and ideas, and are competent in adapting to new situations (Bilgin, 2009; Stahl and Pry, 2005). They consider themselves competent in interpersonal relationships, are assertive and responsible, shows interest and can make sense of their experiences. (Martin and Anderson 1996; Martin and Anderson 1998). In this study, it is thought that the positive relationship between the academic self-efficacy and cognitive flexibility of the physical education and sports teacher candidates is result of the fact that the participants can successfully transfer their experiences in their sports life to the theoretical and

applied courses within the scope of the program they study, and they have proficiency about generating alternative thinking, new ideas and adapting to new situations thanks to their experiences that they have gain in their sports life in solving the problems they encounter in this process.

As a result, it was determined that the academic self-efficacy and cognitive flexibility levels of physical education and sports teacher candidates were above average. A moderate positive relationship was found between academic self-efficacy and cognitive flexibility with alternatives, control sub-dimensions and cognitive flexibility total. It is thought that this is due to the fact that the physical education and sports teacher candidates can transfer their experiences that they gain in their sports life into their education life.

Suggestions

- Studies on larger scale involving physical education and sports teacher candidates can be conducted.
- Studies involving coaching education, sports management and recreation specialization students who are educated in Sport Sciences can be carried out.
- Studies involving physical education and sports teachers working under the Ministry of National Education can be conducted.
- Studies involving Trainers, Sports Managers and Recreation experts working under the Ministry of Sports can be conducted.

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