

# The Analysis of the Relationship Between Teaching/Learning Conceptions and Reflective Thinking in Physical Education Teacher Candidates

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## Abstract

This study aimed to analyse the relationship between teaching/learning conceptions and reflective thinking in physical education teacher candidates. To this end, the study recruited, on a voluntary basis, 640 students who were in 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> grade in the Department of Physical Education and Sports Teaching in the School of Physical Education and Sports at Erciyes, Ahi Evran, Selcuk and Haci Bektas Veli Universities during the 2017-2018 academic year. As data collection tools, the study used the Teaching/Learning Conception Questionnaire, Reflective Thinking Tendency Scale and Socio-demographic Information Form. The data obtained through the scales was statistically analyzed using SPSS 20.0 software. The candidates' personal information and inventory total points as well as factor points were presented by identifying frequency (f) and percentage (%) values. To indicate the relationship between the scores obtained on the scales, the Pearson Moment Product Correlation analysis (r) was conducted while multiple regression analysis was performed to determine whether the scores are predictive of each other. Consequently, it was found that the traditional conception of teaching and learning has no statistically significant relationship with any subscale of the reflective thinking tendency scale. On the other hand, the study revealed that the constructivist conception of teaching and learning is statistically correlated with reflective thinking in general and with the subscales open-mindedness and interrogative and effective teaching.

**Keywords:** teaching/learning conceptions, reflective thinking, physical education

## 1. Introduction

Since teachers play a key role in conveying the recent dazzling changes in education to students, it is discussed what teachers believe in and what kind of variables these beliefs can be related to. Education came directly with the existence of the nation (Eynur, at all. 2013). The studies conducted so far indicate that the beliefs held by teachers influence their teaching and practices substantially. The conceptions of teaching and learning refer to teachers' beliefs about their own teaching practices (Chan, K. W. 2003). Implementation of the decisions made on education depends on, to a large extent, the teacher's effectiveness in class. No matter how well set educational goals are and how functional the content of a course is, it is difficult to achieve the desirable outcomes in education without having qualified teachers (Sünbül, 2001; Kuran, 2002). Beck, Czerniak, and Lumpe (2000) assert that teachers play a fundamental role in reform movements in education and their pedagogical needs are critical for a desirable change in educational reforms (Karhan, 2007). The concept of teaching/learning conceptions refers to teachers' preferences in using teaching and learning methods (Chan & Elliot, 2004). Developments at different periods of educational sciences have also brought along differences in teaching/learning conceptions. In this context, we can mention two main opposing conceptions of teaching and learning in education (Schunk, 2008). These can be called (i) traditional and (ii) constructivist teaching/learning conceptions (Chen & Eliot, 2004). Constructivism as a conception of teaching and learning claims that knowledge cannot be considered independently from the individual, and it is contextual and personal while these meanings held by individuals cannot be conveyed to others (Phillips, 2000). Constructivist learning involves an active process in which individuals construct meaning by combining their prior knowledge with new ideas (Jones & Brader-Araje, 2002). Hence, according to the constructivist approach, knowledge is not merely a copy of the outside world or passively absorbed by passing from an individual to another (Phillips, 2000).

On the other hand, in the traditional conception of teaching and learning, teachers as the sole source of knowledge

in the classroom transfer knowledge to students, who receive such knowledge without questioning (Özden, 2003). Thus, it can be noted that teachers with the traditional conception employ teacher-centred teaching strategies in class and see students as passive recipients of knowledge (Chen & Eliot, 2004; Cheng et al., 2009). Educational practices adopted by teachers play a major role in student achievement. Therefore, the investigation of factors affecting teacher attitudes and behaviours in educational activities is an important area of study for researchers. The studies conducted so far demonstrate that there is a relationship between a teacher's conception of teaching and learning and way of thinking. In this regard, we think that there can be a relationship between reflective thinking tendency and teaching/learning conceptions in teacher candidates. Accordingly, it can be suggested that constructivist and traditional approaches can be related to reflective thinking.

Reflective thinking is based on equipping learners with the main problem-solving skill and use of problem-solving activities in class. In this framework, students should be exposed to problems that they can encounter in daily life (Güvenç, 2012). Dewey (1933) mentions two phases in reflective thinking process: the phase of perplexity, hesitation and doubt in which reflection occurs, and the phase of search and investigation aimed at finding a solution to end such perplexity and dismiss doubt.

In light of the abovementioned points, the aim of this study was to explore the relationship of teaching/learning conceptions with reflective thinking skills in physical education and sports teacher candidates.

## **2. Material and Method**

### *2.1 Research Pattern*

This study used the relational screening method. This method can be defined as “a screening method aiming to determine the existence and/or level of covariance between two or among more than two variables” (Karasar, 2007).

### *2.2 Data Collection Tools*

When administering the scales to the students, the researcher and instructors in the university tried to create a healthy evaluation process for the candidates by making necessary explanations to each of them in a broad time period, without making any rush. In addition, appropriate materials and environmental conditions were provided so that candidates could fill the forms in a comfortable atmosphere. As data collection tools, the study employed the Teaching/Learning Conceptions Questionnaire, Reflective Thinking Tendency Scale and Socio-demographic Information Form.

### *2.3 Formation of Volunteer Groups*

The research was conducted on a study group. The research sample consisted of randomly chosen 640 voluntary students out of 1360 candidates in 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> grades in the Physical Education and Sports Teaching Programme in the School of Physical Education and Sports at Erciyes, Ahi Evran, Selcuk or Haci Bektas Veli universities during the 2017-2018 academic year.

### *2.4 Socio-Demographic Information Form*

After literature review, the researcher created a five question form including questions on gender, age, university, grade and grade point average (GPA) to define the demographic characteristics of the students.

Table 1. Socio-demographic characteristics of participants

	Variable	N	%
Gender	Male	364	56.9
	Female	276	43.1
Age	18-20	124	19.4
	21-23	333	52.0
	24-26	137	21.4
	27 and above	46	7.2
University	Erciyes	160	25.0
	Ahi Evran	160	25.0
	Selcuk	160	25.0
	Haci Bektas Veli	160	25.0
Grade	1	160	25.0
	2	160	25.0
	3	160	25.0
	4	160	25.0
Grade Point Average	1.50-2.00	53	8.3
	2.01-2.50	112	17.5
	2.51-3.00	247	38.6
	3.01-3.50	228	35.6

Table 1 demonstrates that male candidates constituted 56.9% of the participants while female candidates constituted 43.1%. As for age variable, it is seen that 19.4% of the participants were aged between 18 and 20, 52% were between 21 and 23, 21.4% were between 24 and 26 years, and 7.2% were 27 and above. Based on university variable, it is seen that 25% of the participants were in Erciyes, 25% in Ahi Evran, 25% in Selcuk and 25% in Haci Bektas Veli universities. Similarly, 25% of the participants were freshman, 25% were sophomore, 25% were junior and the remaining 25% were senior students. When the participants' grade point averages were analysed, it was found that 8.3% had a GPA between 1.50 and 2.00, 17.5% between 2.01 and 2.50, 38.6% between 2.51 and 3.00, and 35.6% between 3.01 and 4.00.

### 2.5 Teaching/Learning Conceptions Questionnaire

The Teaching and Learning Conceptions Questionnaire was developed by Chan and Elliot (2003), and translated into Turkish by Aypay (2011) after its validity and reliability were tested. The thirty-item questionnaire was subjected to confirmatory factor analysis, and the results demonstrated a compatible model (GFI = 0.93, AGFI = 0.91, RMR 0.50, RMSEA 0.54). According to the results of the factor analysis, the questionnaire has a two-factorial structure representing two approaches (constructivist conception and traditional conception). The alpha reliability coefficient for the 30-item questionnaire form and its sub-factors were found to be .86, .84 and .84, respectively. 5-Likert type scale (5=Strongly agree - 1=Strongly disagree) is used to answer the items in the questionnaire. Higher scores obtained from a sub-factor are interpreted that the conception represented by that factor is adopted by the respondent (Chan & Elliott 2004).

### 2.6 Reflective Thinking Tendency Scale

"Reflective Thinking Tendency Scale" (RTTS) which was developed by Semerci (2007) for teachers and teacher candidates was administered to 599 teacher candidates initially. For this purpose, a literature review was conducted, similar scales were analyzed and as a result, 43 items were determined to include in the item pool. After receiving expert and student views, consensus was reached on a total of 41 items—20 negative and 21 positive items. The 41 item scale was administered to 599 subjects. The resulting data was subjected to factor analysis, and six items with load factors less than 0.35 were not included in the RTTS. In addition, the study performed Bartlett's test, and Kaiser-Meyer-Olkin (KMO) test used to measure sampling adequacy for performing factor analysis. According to the results of the factor analysis for the RTTS, the KMO value was 0.909 while the value of Bartlett's test was 6811.461 (Sd: 595,  $p < 0.05$ ). The reliability coefficient of the scale (the Cronbach's Alpha) was found to be 0.907 (Semerci, 2007).

### 2.7 Data Analysis

Data obtained through the Personal Information Form, Teaching/Learning Conceptions Questionnaire and Reflective Thinking Tendency Scale, and the scores obtained from the assessment were coded and computed using

the SPSS 20.0 software program, which was also used to perform analyses. The candidates' personal information and inventory total points as well as factor points were presented by identifying frequency (f) and percentage (%) values. To indicate the relationship between the scores obtained from the scales, the Pearson Moment Product Correlation analysis (r) was conducted while multiple regression analysis was performed to determine whether the scores are predictive of each other. ( $\beta$ )

### 3. Findings

Table 2. Descriptive statistics of participants' scores on the scales

		N	Minimum	Maximum	X $\pm$ SD
Teaching Learning Conceptions	Constructivist	640	24.00	60.00	44.82 $\pm$ 7.26
	Traditional	640	28.00	89.00	62.81 $\pm$ 9.79
Reflective Thinking	Continuous and Intentional Thinking	640	12.00	32.00	20.80 $\pm$ 5.37
	Open-mindedness	640	6.00	28.00	16.39 $\pm$ 6.64
	Interrogative and Effective Teaching	640	5.00	24.00	12.71 $\pm$ 5.65
	Teaching Responsibility and Science	640	5.00	25.00	16.12 $\pm$ 4.53
	Researcher	640	8.00	28.00	18.76 $\pm$ 5.01
	Foresighted and Sincere	640	4.00	20.00	14.12 $\pm$ 3.47
	Looking Professional	640	3.00	10.00	7.16 $\pm$ 2.09
	Creative Thinking in Total	640	61.00	164.00	106.06 $\pm$ 26.24

The analysis of Table 2 indicates that the students' mean score for the constructivist conception of teaching and learning was 44.82 while the mean score for the traditional method was 62.81. As for the subscales of reflective thinking tendency, the mean score was 20.80 for continuous and intentional thinking, 16.39 for open-mindedness, 12.71 for interrogative and effective teaching, 16.12 for teaching responsibility and science, 18.76 for researcher, 14.12 for foresighted and sincere, and 7.6 for looking professional while the mean score for reflective thinking tendency overall was 106.06.

Table 3. Correlation coefficients between students' teaching/learning conceptions and reflective thinking (n=640)

	1	2	3	4	5	6	7	8	9	10
Traditional <sup>1</sup>	r	1								
	p									
	N	640								
Constructivist <sup>2</sup>	r	.595**	1							
	p	.000								
	N	640	640							
Continuous and Intentional Thinking <sup>3</sup>	r	-.011	.027	1						
	p	.776	.488							
	N	640	640	640						
Open-mindedness <sup>4</sup>	r	.065	.126**	.518**	1					
	p	.100	.001	.000						
	N	640	640	640	640					
Interrogative and Effective Teaching <sup>5</sup>	r	.064	.106**	.660**	.763**	1				
	p	.105	.007	.000	.000					
	N	640	640	640	640	640				
Teaching Responsibility and Science <sup>6</sup>	r	.016	.072	.694**	.554**	.715**	1			
	p	.693	.067	.000	.000	.000				
	N	640	640	640	640	640	640			
Researcher <sup>7</sup>	r	-.008	.055	.585**	.396**	.614**	.632**	1		
	p	.843	.168	.000	.000	.000	.000			
	N	640	640	640	640	640	640	640		
Foresighted and Sincere <sup>8</sup>	r	-.033	.015	.588**	.410**	.497**	.581**	.756**	1	
	p	.400	.704	.000	.000	.000	.000	.000		
	N	640	640	640	640	640	640	640	640	

Looking Professional <sup>9</sup>	r	.000	.004	.450**	.252**	.471**	.496**	.539**	.611**	1
	p	.995	.917	.000	.000	.000	.000	.000	.000	
	N	640	640	640	640	640	640	640	640	640
Creative Thinking in Total <sup>10</sup>	r	.025	.085*	.823**	.769**	.888**	.845**	.795**	.757**	.606**
	p	.532	.031	.000	.000	.000	.000	.000	.000	.000
	N	640	640	640	640	640	640	640	640	640

The analysis of Table 3 demonstrates that there was no correlation between the traditional teaching/learning conception and reflective thinking and its subscales. However, there was a significant relationship between the constructivist teaching/learning conception and open-mindedness ( $r=.126$ ,  $p=.001$ ), interrogative and effective teaching scores ( $r=.106$ ,  $p=.007$ ) and with total reflective thinking tendency score ( $r=.085$ ,  $p=.031$ ), whereas the study found no significant relationship with other subscales.

Table 4. Regression table for students' teaching/learning conceptions to predict their reflective thinking tendency

	$\beta$	t	p	R	R <sup>2</sup>	F	P
Reflective Thinking				.113	.013	1.172	.317
Traditional	Continuous and Intentional Thinking	-.104	-1.290	.197			
	Open-mindedness	.065	1.646	.100			
	Interrogative and Effective Teaching	.062	.491	.623			
	Teaching Responsibility and Science	-.037	-.461	.645			
	Researcher	-.044	-.583	.560			
	Foresighted and Sincere	-.094	-1.109	.268			
	Looking Professional	.000	.002	.999			
	Creative Thinking in Total	.193	.750	.454			
Reflective Thinking				.151	.023	2.097	.042
Constructivist	Continuous and Intentional Thinking	-.175	-2.177	.030*			
	Open-mindedness	.126	3.201	.001*			
	Interrogative and Effective Teaching	-.061	-.482	.630			
	Teaching Responsibility and Science	-.042	-.520	.603			
	Researcher	-.025	-.333	.740			
	Foresighted and Sincere	-.129	-1.525	.128			
	Looking Professional	-.063	-1.211	.226			
	Creative Thinking in Total	.474	1.851	.065			

F(8.631).

The analysis of Table 4 shows that the model established between the traditional conception of teaching/learning and reflective thinking does not provide a significant correlation ( $R=.113$ ,  $R^2=.013$ ;  $p > .01$ ). On the other hand, Table 4 also indicates that the model established between the constructivist conception of teaching/learning and reflective thinking presents a significant relationship ( $R=.151$ ,  $R^2=.023$ ;  $p < .05$ ). When the t-test results for the significance of regression coefficients were analysed, it was found that the scores of the subscales "continuous and intentional thinking" ( $t=-2.177$ ,  $p=.030$ ), open-mindedness ( $t=3.201$ ,  $p=.001$ ) and reflective thinking overall ( $t=1.851$ ,  $p=.065$ ) suggest that the constructivist conception of teaching and learning predicts reflective thinking tendency, explaining 23% of total variance ( $F(8.631)=2.097$ ,  $p < .05$ ).

#### 4. Discussion and Conclusion

Teaching and learning approaches preferred by teachers have a major impact on their students. The preference of traditional approach does not serve modern education systems and seems so distant to student-centred education. Researches indicate that student satisfaction can be increased by face-to-face communication with students (Şahin et al., 2014). One of the aims of modern education systems is to train students with a system that allows them to inquire and become active in educational processes while motivating creative and reflective thinking. Thus, the preference of constructivist approach by teachers is regarded as a desirable situation. The results of this study indicate that;

There was no statistically significant relationship between the traditional teaching and learning conception that

prevents students from expressing their ideas freely while encouraging them to rote learning, and overall reflective thinking tendency and its subscales. On the other hand, the study found positive significant relationships between the constructivist approach and open-mindedness, and interrogative and effective teaching subscales of reflective thinking tendency as well as total reflective thinking score.

Open-mindedness entails characteristics such as looking at things from different perspectives, being open to all types of questions, reactions and recommendations concerning teaching practices, valuing educational activities and thus, reviewing teaching gains. Similarly, in the constructivist learning/teaching model, the student does not adopt a passive attitude, waiting for the teacher to do everything. Instead, he strives to reflect, plan learning and ask questions, discuss, take part in group activities with other students and present his findings (Şanlı, 2016). As is seen in the definitions, open-mindedness and constructivism complement each other. It would only be normal that an open-minded, inquiring teacher candidate displays behaviours such as being active in the learning process, wanting to examine a subject thoroughly or asking questions, i.e. gravitating to the constructivist model.

In literature review, we found no study focusing on the relationship between open-mindedness and preferred conception of learning/teaching. However, in their study on teacher candidates to examine the relationship between critical thinking adopted in the constructivist approach and open-mindedness, Demir and Kaya (2015) identified a significant relationship between critical thinking and open-mindedness (Kaya & Özdemir 2015). Besides, this finding is also supported with the results of a study by Argon and Selvi (2011) on teacher candidates' critical thinking and conflict resolution styles.

Interrogative and effective teaching involves certain aspects such as having a critical viewpoint, giving importance to learning with cooperation, valuing students' dreams and using concept maps and new materials in class, etc. (Şanlı, 2016). On the other hand, students in classrooms using constructivist model shape their learning process according to their prior knowledge on the topic, mental structure and perception of the environment Korkmaz (2004), and they are encouraged to think and hypothesise on a problem and test these hypotheses. This process nurtures critical thinking, allowing students to become active and motivated. In this way, students develop the skill to apply the knowledge they learn to other problems. It helps them to ascend to the top three steps (analyse, evaluate and create) (according to Bloom's Taxonomy) of the cognitive domain. As the definitions suggest, it is constructivist approach that enables students learn in an inquiring and effective way. In literature review, we found no study that explores the relationship between the preferred learning/teaching conception and interrogative and effective teaching, but some of the studies on interrogative and effective teaching are as follows;

In his study found that interrogative and effective teaching varies significantly across sex (Şanlı, 2016). A study by Kılıç (2010) indicates that increased teaching experience is not related to teachers' preference for interrogative and effective teaching. In a study on students of the school of physical education, Adatepe (2018) revealed that teacher candidates obtained the highest score for the subscale "Interrogative and Effective Teaching" on the reflective thinking tendency scale. In reflective thinking, providing students with the main problem solving skill depends on the use of problem solving activities in class. Students should be exposed to problems they might encounter in daily life (Güvenç, 2012). A teacher who thinks reflectively changes and improves himself throughout his life. He consistently evaluates his teaching and takes lifelong learning as a goal (Semerci, 2007).

Reflective thinking is the whole of creative problem solving activities that is based on constructivist teaching, emphasises caring for others and adopts an inquiring approach (Ergen, 2014). According to the result of his study, Kerimgil (2008) reports that long term use of constructivist curricula in experimental studies can enhance reflective thinking.

In their study "Contributions of Teachers' Behaviours on Creative Thinking Abilities", Yenilmez and Yolcu (2007) assert that the traditional teacher-centred education hinders the development of high level thinking skills such as creativity and reflective thinking, and thus, it is necessary to adopt the student-centred education that motivates students to make autonomous choices. Another study by Özer (2007) comes to the conclusion that individuals who have been exposed to the traditional teaching method are incapable of developing high level intellectual skills.

Furthermore, Susam (2006) maintains that constructivism is the best teaching approach for students to think scientifically, gain abilities such as constructivist, creative, critical and reflective thinking, become enthusiastic about inquiring, participate in activities and undertake responsibility, and make it a habit to searching and using sources. At the end of her study, it was revealed that people who were subjected to the traditional teaching method had lower success rates compared to the experimental group.

Consequently, this study found that the traditional conception of teaching and learning was not related to reflective thinking skills in the physical education teacher candidates while there was a relationship between the constructivist approach and their reflective thinking skills. We believe that training the candidates according to the

constructivist approach to enhance their high level intellectual skills as the teachers of future will also increase professional qualities of teachers.

## 5. Recommendations

- Future studies can include teacher candidates in other fields while also including different intellectual skills in addition to reflective thinking.
- After conducting a situation assessment, practice-based experimental studies can be carried out, and it can be observed if there is any improvement.
- Teacher training schools can hold activities to improve high level intellectual skills.
- Scales can be administered to those who actively engage in teaching, and after assessments, in-service training could be provided to raise awareness.

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