

Investigating Physical Education Teacher Candidates' Epistemological Beliefs

Uğur Abakay

Higher School of Physical Education and Sports, Gaziantep University, Gaziantep, Turkey

Email: uabakay@gmail.com

Abstract: Epistemological beliefs are perspectives of individuals about what the knowledge is, how it is collected, the limits determined for knowledge and what the criteria are for knowledge. While epistemological beliefs affect the learning processes, learning processes can be effective on the formation of the epistemological beliefs. The aim of this study is to determine the relationships of the physical education and sports teachers' learning, epistemological beliefs about teaching and also determine the relationship between the sub-dimensions about these beliefs. The survey method was used in the study. Research was carried out with 55 physical education and sports teacher candidates in last class. "Epistemological Beliefs, Beliefs Related to Teaching and Learning Scale" was used as a data collection tool in the study. As a result, it was found that physical education teachers' learning is relative, learning depends on the effort and process and the levels of beliefs related with the teaching should be constructive were high and it was also found that there are significant relationships among the beliefs about learning and teaching.

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1. Introduction

From the first centuries to present the question of "what is knowledge" attracted the attention of philosophers, educators and scientists. So that, this age known as knowledge age and the communities exist this age known as knowledge community due to the rapid accession to knowledge. In today world which is considered as the knowledge age, without a doubt, the most important factors in the development of societies are educated people and educated work force. The success of the education system mostly depends on the qualifications of the teachers; as a result of this the examination of the thought beliefs of the teachers became very important (Eroğlu ve Güven, 2006). One of the most beliefs of the teachers is epistemological beliefs which are related with the nature of knowledge and teaching.

Epistemological beliefs greatly affect the education-teaching trainings of the teachers such as which teaching method and techniques will use, who to manage the class, where to focus in learning (Öngen, 2003).

Since epistemological beliefs have close relationship with learning-teaching process and particularly also have important effects on the conceptualization styles (Chan and Elliott, 2004) of teaching and teaching approaches (Sinatra and Kardash, 2004) of the teachers the investigation of epistemological beliefs of the teacher candidates become more and more important each passing day. For this reason this study is very important for investigation of the epistemological beliefs of the teacher candidates of the future.

It can be said that the causes of all decisions taken during the entire life and exhibited behaviors of an individual are their beliefs (Hofer and Pintrich, 1997; Pajares, 1992).

Beliefs are perceived as internal assumptions that without doubt to be true by the individual in terms of all kinds of events of an individual facing during the life, how perceive the person or object, meanings and determine how to treat him. There is not a precise definition of the belief which is accepted as the product of internal process and the self-perception of the individual. For this reason belief associated with the knowledge which is the product of individual processes and an effort in this direction eventually has to rely on the distinction between belief and knowledge (Deryakulu, 2006). Since the people expect to use the knowledge and beliefs (Hacıkadıroğlu, 2002; Denkel, 2003) to solve the problems faced in daily lives, these two concepts are used interchangeably (Mason, 2002). This linkage between belief and knowledge directed us to epistemological belief concept which is a result of natural process (Ravindran, et. al., 2005; Özden, 2003; Hofer & Pintrich, 1997).

Epistemological beliefs are in general personal beliefs about the idea of what the knowledge is, knowing and how learning takes place (Deryakulu, 2004; Schommer, 1994). Similarly Perry (1981) defined epistemological beliefs as perspectives of the individuals on what the knowledge is, how it is collected, and the limits determined for knowledge and what the criteria are. The important effects of epistemological beliefs on knowledge were indicated

in the previous studies (Ongen, 2003; Deryakulu, 2004; Eroğlu, 2004; Deryakulu & Büyüköztürk, 2002; Deryakulu, 2006; Hofer, 2001; Schommer, 1990; Muis, 2004).

As a result of the studies it has been observed that epistemological beliefs have decisive effects on the style of data processing and interpretation of new knowledge, comprehension levels, criteria for monitoring the levels of grip, chosen and used study strategies, higher-level thinking and problem-solving approaches, efforts spent for learning and time (Aksan, 2006; Tolhurst, 2002). In this respect epistemological beliefs have been divided following sub-dimensions at the previous studies:

- a) Knowledge (Schommer & Dunnell, 1997; Young, 2000; Brownlee, 2001)
- b) Learning (Chai et al., 2009; Zhu et al., 2008; Deryakulu, 2004; Buehl, 2003)
- c) Teaching (Chan & Elliott, 2004)

According to Hofer (2002) while epistemology considered as method used to obtain the knowledge, the nature of knowledge, accessibility and accuracy in the light of philosophical basis, with the educational perspective epistemology is concerned with how knowledge is created and developed. Schommer (1990) claimed that individuals accept and believe the knowledge as either accurate or relative in the process of the creation of knowledge.

As for looking at the beliefs of individuals intended for learning which is the other sub-dimension of the epistemological beliefs, it has been determined that learning vary depending on effort, ability and process (Chai et al., 2009; Zhu et al., 2008).

The other sub-dimension beliefs of individuals intended for teaching is described in the two categories; firstly, one on one transfer of knowledge process (traditional approach), secondly interpretation of knowledge process by students (constructivist approach) (Chai et al., 2009). Individuals with a constructivist epistemology considered knowledge in the process and construct the knowledge again with their effort rather than a passive participation using constant knowledge directly according to their ability. Since the knowledge internalized such a process, oppositely to the absolutism advocated by the traditional belief, individuals form own perspectives and believe that many ways to reach the truth (Buehl, 2003).

Many of the previous studies indicated that there is a strong relationship between the teachers' epistemological beliefs and their classroom behaviors and learning environments (Brown & Rose, 1995; Kagan, 1992; Nespor, 1987; Chan & Elliott, 2004). Due to the teachers' beliefs affected from their education, the teacher candidates' beliefs and

examining the changing process has been the subject of many researches (Aldrich & Thomas, 2005; Chai, et al., 2009). It has been thought that epistemological beliefs will be effective on teacher candidates' teaching practices both in the classroom and in-service (Wilson, 1990; Richardson et al., 1991; Lawrence, 1992; Pajares, 1992; Renne, 1992; Shaver, 1992; Brownlee, 2003) an increase have observed in studies on the effects of epistemological beliefs in teacher education (Kincal et al., 2010). Epistemological beliefs have critical importance in teacher education, a significant impact on teacher's behavior and judgments and what kind of conclusions take place. These factors can be shown as the reasons for the increment of the studies on this subject. However, it is seen that the teachers' epistemological beliefs do not sufficiently taken into account in teacher education programs (Nespor, 1987; Akt: Brownlee, 2003). Belenky et al. (1986 Akt: Brownlee, 2003). As a result of the combination of the experiences of the students and education, the students will both use their experiences and the expressions of professionals for the ways of knowing. This situation imposes more and more sophisticated meaning to the ways of knowing (Brownlee, 2004). Therefore, to provide desired change in Faculties of Education, the relationship between the teacher candidates' epistemological beliefs with learning and teaching should not be ignored (Chan & Elliott, 2004). Studies show that the importance of the studies on teachers' epistemological beliefs is increasing with each passing day. This situation has been a source of inspiration for the study, in this respect the physical education and sports teacher candidates' knowledge, learning and determining the relationship between epistemological belief levels related to teaching with sub-dimensions of belief constitute the aim of this study.

The problem of the study

The aim of this study is to analyze the physical education teacher candidates' epistemological beliefs. In the direction of this aim the answers of the following questions have been investigated:

- 1- Physical education teacher candidates'
 - a. Knowledge (Accurate/relative)
 - b. Learning (ability/effort/Process)
 - c. Epistemological belief level regarding to teaching (traditional/constructivist)
- 2- Is there a relationship between physical education teacher candidates' beliefs regarding to knowledge, learning and teaching?

2. Material and Methods

Research pattern

Since the aim of this study is to put forward physical education teacher candidates' with present status, descriptive method has been used.

Sample

The sample group was established with the appropriate sampling method which is based on accessibility and availability. 55 last year teacher candidates attending to the Gaziantep University Higher School of Physical Education and Sports in 2012-2013 academic years. Some of the personal characteristics of the sample group are shown in table 1.

Data collecting tool

Epistemological Beliefs Questionnaire Related with Teaching and Learning developed by Chai et al. (2009) and adapted to Turkish by Kınca et al. (2010) was used as a data collection tool to determine the physical education teacher candidates' epistemological levels. This measurement tool consist of twenty four (24) questions intended for the beliefs

related to knowledge and learning and thirty (30) questions for measuring the beliefs related to teaching.

Table 1. Characteristics of sample group

| | | F | % |
|----------------------------|-----------|----|------|
| Age | 21 | 14 | 25,5 |
| | 22 | 22 | 40,0 |
| | 23 | 19 | 34,5 |
| Gender | Female | 28 | 50,9 |
| | Male | 27 | 49,1 |
| Grade point average | 2.0 - 2.5 | 39 | 70,9 |
| | 2.6 - 3.0 | 16 | 29,1 |

Table 2. Sub-dimensions present in data collection tool and subjects

| Sub-dimension | Subject |
|----------------|---|
| Accurate | I do not in a doubt about the statements of the experts. |
| Relative | Information and advices from experts frequently interrogated as well. |
| Ability | You can not make yourself more intelligent than were born. |
| Effort | If an individual shows enough effort, he/she can understand the lesson |
| Process | If the individuals focus on understanding process rather than information/phenomenon they learn better. |
| Traditional | The main role of the teacher is to transmit the information to students |
| Constructivist | Education should have enough flexibility to expose the personal differences between the students. |

Measurement tool was created as a five-point Likert type. While the points obtained from the accurate knowledge sub-dimension range from 4-20, from the relative knowledge sub-dimension 3-15. The points obtained from the ability sub-dimension may range from 5-25, from the effort sub-dimension range from 9-45 and from the Process sub-dimension range from 3-15. While the points range from 17-85 in traditional sub-dimensions, in constructivist sub-dimension it ranges from 13-65. The Cronbach's alpha reliability coefficient of the measurement tool is calculated as 0.80.

Data collection process

Measurement tool was carried out on 4th class physical education students in Gaziantep University, Higher School of Physical Education and Sports, Department of Physical Education and Sports Teaching attending to "Management Organization in Physical Education and Sports" lesson. Explaining the purpose and the importance of the study all 55 students taking this course participated to the study voluntarily. It has been observed that the measurement tool is filled in approximately 40 minutes.

Data analysis

The data obtained from the measurement tool were analyzed using SPSS 15.0 statistical package program. Means, standard deviations, minimum and

maximum scores were calculated for each sub-dimension. In addition, accurate percentages were calculated with the following formula;

$$\text{Percentage(\%)} = \frac{\text{Mean score} - \text{minimum score}}{\text{Maximum score} - \text{minimum score}} \times 100$$

With this calculating method, the level of the teacher candidates' beliefs related to each belief sub-dimension is aimed to be more understandable. Pearson Moment Calculation was used to determine the correlation between the beliefs related to knowledge, learning and teaching. In the interpretation of the correlation values 0-0,49 r values considered as weak, 0,5-0,74 r values considered as mid and 0,75-1 r values considered as strong correlation.

3. Findings**Findings related to the first sub-problem**

In this sub-problem, the teacher candidates' beliefs level related to knowledge, learning and teaching has examined.

This sub-problem of teacher candidates, knowledge, beliefs about learning and teaching is the level at which examined. Obtained results are given in Table 3.

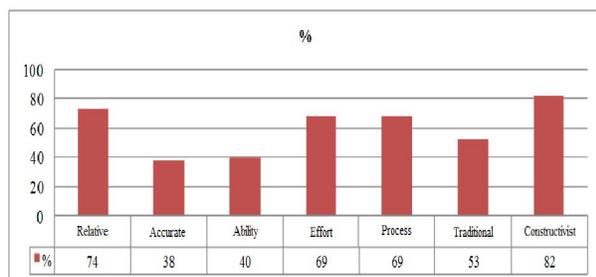
Table 3. Values related to the physical education teacher candidates' beliefs levels associated with knowledge, learning and teaching

| | | N | x | Ss. | % | Level |
|-----------|----------------|----|-------|-------|----|--------|
| Knowledge | Relative | 55 | 11,90 | 1,590 | 74 | High |
| | Accurate | 55 | 10,03 | 2,918 | 38 | Middle |
| Learning | Ability | 55 | 13,09 | 3,400 | 40 | Middle |
| | Effort | 55 | 33,87 | 5,09 | 69 | High |
| | Process | 55 | 11,36 | 1,53 | 69 | High |
| Teaching | Traditional | 55 | 53,29 | 10,98 | 53 | Middle |
| | Constructivist | 55 | 55,78 | 8,945 | 82 | High |

When the above table examined it is seen that 74% (high) of the teacher candidates believe that knowledge is relative, 38% (middle) of believe that knowledge is accurate. According to these findings it can be said that teacher candidates believe that knowledge is relative.

According to the table, 40% of the teacher candidates believe that learning related to genetic (ability), 69% believe that learning related to effort and 69% believe that learning related to process. According to these findings it can be said that learning is depend mostly on effort and process.

The findings related to teacher candidates' beliefs associated with knowledge, learning and teaching can be seen in graph 1.



Graph 1. Values related to teacher candidates' belief levels

Findings related to the second sub-problem

In this sub-problem, the correlation between sub-dimensions associated with knowledge, learning and teaching were investigated. The findings are as follows.

When the findings seen in table 4;

There is a weak positive relationship between the belief related to that of knowledge is relative and knowledge is accurate ($r = ,272$).

There is a middle positive relationship between the belief related to that of learning depends on genetic ($r = ,535$) and positive middle relationship between the belief related to that of learning depends on effort ($r = ,511$).

While there is a weak positive relationship

between the belief related to that of knowledge is accurate and that of learning is genetic ($r = ,429$), there is a positive middle relationship with the belief related to that of learning depends on effort ($r = ,548$) and a positive weak relationship with the belief related to that of learning depends on the process ($r = ,279$).

When the correlation between the beliefs about the relativity of the knowledge and teaching examined, it is seen that while there is not a significant correlation with the belief related to that of teaching should be traditional ($r = ,099$), a strong positive correlation is seen with the belief related to that of teaching should be constructivist ($r = ,771$).

While there is a middle relationship between the accuracy of the knowledge and the belief of teaching should be traditional ($r = ,665$), there is not a relationship with the belief of teaching should be constructivist ($r = -,017$).

The table also shows the relationships among the beliefs. There is a positive weak relationship ($r = ,326$) between the belief of learning depends on effort and the belief of learning depends on ability (genetic), similarly there is a positive weak relationship with the belief of learning depends on process ($r = ,447$).

As a result of the statistical analysis it has been found that there is not a significant correlation between the beliefs of learning depends on process and learning depends on ability (genetic).

While a positive weak relationship calculated between the beliefs of learning depends on ability (genetic) and the belief of teaching should be traditional ($r = ,345$), a significant correlation has not found with the belief of teaching should be constructivist.

As can be seen in the table there is a positive middle relationship between the belief of learning depends on effort and the belief of teaching should be traditional ($r = ,537$) and there is a positive weak relationship with the belief of teaching should be constructivist ($r = ,494$).

In addition to above findings there is also a positive weak relationship between the beliefs of teaching should be constructivist and traditional ($r = ,341$).

Table 4. Values related to the relationship between the physical education teacher candidates' belief levels associated with knowledge, learning and teaching

| | | | Belief about knowledge | | Belief about learning | | | Belief about teaching |
|------------------------|-----------------------|---|------------------------|----------------------|-----------------------|-----------------|------------------|-----------------------|
| | | | Relative | Authority (Accurate) | Ability (Genetic) | Learning Effort | Learning Process | Traditional Teaching |
| Belief about knowledge | Relative | r | 1 | | | | | |
| | Authority (Accurate) | r | ,272* | 1 | | | | |
| Belief about learning | Ability (Genetic) | r | ,535* | ,429** | 1 | | | |
| | Learning Effort | r | ,511* | ,548** | ,326* | 1 | | |
| | Learning Process | r | ,701** | ,279* | ,207 | ,447** | 1 | |
| Belief about teaching | Traditional Teaching | r | ,099 | ,665** | ,345** | ,537** | -,022 | 1 |
| | Constructive Teaching | r | ,771** | -,017 | -,127 | ,494** | ,036 | ,341* |

n=55, *p<0.05, **p<0.01

4. Discussion and Conclusion

It has been aimed to determine the physical education teacher candidates' beliefs associated with knowledge, learning and teaching.

As a result of the study it has been found that the physical education and sports teacher candidates' belief level is high about knowledge is relative, the belief level is middle about knowledge is accurate. As well as it is known that cultural differences have impact on epistemological beliefs, Chan (2003) found a similar result. Chan revealed that students do not believe the certainty of knowledge.

According to the study it has been determined that physical education teacher candidates' belief levels related to learning mostly depends on effort and process is higher, belief levels related to learning depends on ability is middle. This result is parallel with the results obtained from the study carried out by Aypay (2011). Aypay found that teacher candidates interrogate the source of knowledge; they also believe that the effect of innate abilities on learning is lower and accordingly, the effect of the effort and process is higher. Similarly there are other studies with similar results (Schommer et al. 2000; Schreiber & Shinn, 2003). Aypay (2011), Çağlayan and Mehtap (2010), Eroğlu and Güven (2006), Chan (2003), Chan and Elliot (2002/2004) and Chai et al. (2006) found similar results with our study that effort and process are very important for epistemological beliefs.

When the findings about beliefs related to how teaching should be examined, it is seen that physical education teacher candidates' belief levels related to teaching should be constructivist are higher, belief levels related to teaching should be traditional are middle. Especially since 2005-2006 elementary school programs depend on Ministry of National Education of the Republic of Turkey changed according to constructivist approach. As a result of this change in the programs, teacher candidates

receive education in this direction and thus it is observed that the teachers' epistemological beliefs changed based on constructivist approach (Kincal et al., 2010).

It can be said that there are significant relationships between the beliefs of sample group about knowledge, learning and teaching. While the belief of knowledge is relative increases the belief of knowledge is accurate increases too. Similarly while the belief of knowledge is relative increases, the beliefs of learning depend on ability (genetic) and effort increase too. In addition, while the belief of knowledge is accurate increase, the beliefs about learning (genetic, effort, process) increase too.

When the correlation between the beliefs about teaching and the relativity of knowledge examined, it has been found that with the increment of the beliefs that teaching should be constructivist, beliefs that knowledge should be relative increase too. It has also determined that with the increment of the beliefs that knowledge is accurate, the beliefs that teaching should be traditional increase too. In addition, with the increment of the beliefs that teaching should be constructivist, the beliefs that teaching should be traditional increase too.

When looking at the relationship between the beliefs about learning, it has been found that with the increment of the beliefs that learning depend on effort, the beliefs that learning depend on ability (genetic) and process increase too. As a result of the study it has also found that with the increment of the beliefs that learning depend on ability (genetic), the beliefs that teaching should be traditional increase too. In addition, with the increment of the beliefs that learning depend on effort, the beliefs that teaching should be traditional and constructivist increase too.

Consequently; it was found that the physical education teacher candidates' belief levels that knowledge is relative, learning depend on ability and effort, teaching should be constructivist were higher.

In addition, it can be said that there are significant relationships between the beliefs about knowledge, learning and teaching. For these reasons, to provide the awareness to the teachers and teacher candidates about epistemological beliefs is very important.

Corresponding Author:

Higher School of Physical Education and Sports,
Gaziantep University,
Gaziantep, 27310, Turkey.
Email: uabakay@gmail.com

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