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Procedia Social and Behavioral Sciences 2 (2010) 4250–4254

Procedia
Social and Behavioral Sciences

WCES-2010

Preservice elementary teachers' perceptions of their self-efficacy in teaching thinking skills

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Received November 3, 2009; revised December 11, 2009; accepted January 19, 2010

Abstract

Preservice teachers' self-efficacy in teaching the thinking skills included in the curriculum is important to the achievement of objectives. What are the self-efficacy levels of preservice teachers in teaching thinking skills? The present study aims to determine the self-efficacy of preservice teachers in this area. The study is of a descriptive nature and uses the survey model. The study sample consists of a total of 263 third and fourth-year students from Marmara University, Atatürk Education Faculty, Elementary Teacher Education Department. The scale used in the study had been developed for Tebb's PhD dissertation entitled "Assessing Teachers' Self-Efficacy towards Teaching Thinking Skills" and was adapted into Turkish by Kaya (2008). The data were analyzed by using arithmetic means, standard deviation, independent samples t- test, analysis of variance, and Pearson product-moment correlation analysis.

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Keywords: Thinking skills; self-efficacy; problem-solving; decision-making; creative thinking; critical thinking.

1. Introduction

It is generally accepted that thinking – despite being an inherent human skill – can be improved with effort. In recent years, the teaching of thinking skills has become an important topic in educational systems. Although many skills are included in the concept of thinking skills, researchers agree that the main thinking skills are critical thinking, creative thinking, problem-solving and decision-making.

In recent years, much effort has been spent to align the Turkish education system with modern-day requirements. To illustrate, objectives about thinking skills have been added to the goals of education and these goals have been readjusted improve thinking skills. In the curriculum of 2005, thinking skills were listed and the content was developed accordingly. At the base of this curriculum lies the aim of teaching constructed and complex higher-order thinking skills, which include the integration of many behaviors. One-dimensional thinking is not sufficient in our rapidly changing world to envision the future. The role of the teacher, who needs to respond to today's and tomorrow's expectations, has also changed.

A skill may be defined as "a talent that is intended to be acquired and improved by students within the learning process and transferred to real life" (MEB, 2005). The mental processes that are necessary for students to learn and

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maintain the information and methods required to solve basic problems are generally known as thinking skills (Turner, 1999:160). These skills include the knowledge, talents and attitudes which enable people to decide on what to believe (Livingstone, 1988: 8). *Developing Minds: A Resource Book for Teaching Thinking*, a project planned by Bruning, Schraw & Ronning (1995) and undertaken by the US Association for Supervision and Curriculum Development with the involvement of 60 prominent researchers and educators in 1991 listed the types and skills of thinking as critical thinking, creative thinking, decision-making and problem-solving. Owing to the consensus on these four skills, the present study also takes them as the major thinking skills.

Thinking is a skill that can be taught. Therefore, instructional processes need to develop thinking skills (Doğanay, 2004; İnan and Özgen, 2008; Saban, 2004). The teacher has an important role in this process. The efficacy of pre- and in-service teachers in teaching thinking skills is critical to the achievement of skill-related curriculum goals. The fulfillment of the requirements of the teaching profession relies not only on offering a good theoretical university education, but also teachers' perception of their own efficacy in meeting these requirements and responsibilities. Bandura (1997) and Zimmerman (1995) define the concept of self-efficacy as a quality which shapes behavior, and as the self judgment of one's capacity to organize and successfully carry out activities required for a certain performance (cited in Ekici, 2008).

Bandura (1997) states that teacher efficacy and self-efficacy expectations play a critical role in providing an educational environment that aims to develop children cognitively (cited in Yavuzer and Koç, 2002). Tschannen-Moran et al. (1998) define teacher efficacy as teacher beliefs that they are able to achieve intended learning and student participation outcomes even in the least motivated and difficult students. Likewise, Guskey and Passaro (1994) define the term as self-confidence in teachers that they offer students an effective instruction, while Ashton defined it as teacher beliefs about their capacity for influencing student performance (cited in Gençtürk 2008).

Successful teacher education programs should improve student teachers' belief in themselves. Soodak and Podell (1996) argue that these programs should instill and improve student teachers' feelings of efficacy. Thus, having information about preservice teachers' ideas about their own efficacy would help prepare them to teach (cited in Akdağ and Walter, 2005). Measuring pre- and in-service teachers' self-efficacy beliefs in certain areas allows a better understanding of their behaviors (Kaya, 2008).

This study aims to identify the self-efficacy levels of preservice elementary teachers about the teaching of thinking skills; whether self-efficacy levels in teaching thinking skills vary by year of study; their self-efficacy levels in creating a classroom environment that fosters thinking (Factor 1), teaching higher-order thinking skills (Factor 2), teaching transfer (Factor 3) and recognizing how students think (Factor 4); and the relationship between preservice teachers' self-efficacy in the factors and their analytical, practical, creative and critical thinking levels.

2. Method

This is a descriptive study using the survey model. Surveys aim to describe a past or present situation as it is. The topic of the study, be it an individual or object, is defined in its own context as it is (Karasar, 2008). This study intends to reveal the self-efficacy levels of preservice elementary teachers about the teaching of thinking skills.

2.1. Population and sample

The population of the study included preservice teachers attending Marmara University, Ataturk Education Faculty in Istanbul. The sample consisted of a total of 263 third and fourth-year students from the Elementary Teacher Education Department of Marmara University during 2009-2010.

2.2. Data collection instrument

The scale used in the study had been developed by Tebbs in 2000 at Connecticut University to be used in his doctoral dissertation "Assessing Teachers' Self-Efficacy Towards Teaching Thinking Skills", with the suggestions and supervision of expert academics in teaching thinking skills. The scale was adapted into Turkish by Kaya (2008) and translated by English language experts. It was evaluated with respect to its suitability to Turkish, its contents and measurement and evaluation. In line with the views obtained, the revised scale was tested for validity and reliability by being implemented on 77 fourth year pre-service teachers from Niğde University, Education Faculty, Social Studies Education Department. Factor analysis showed that the adapted Turkish scale had five factors;

however, it was decided that the four factors of the original scale would be used. The alpha value for the total scale was .94 (Kaya, 2008). It consisted of two parts: the first part included 11 items and examined how pre-service teachers defined their personal information and themselves, and the second part included 25 items about pre-service teachers' self-efficacy in teaching thinking skills.

2.3. Data analysis

The quantitative data obtained were analyzed by using the statistical package SPSS for Windows. The methods of arithmetic mean, standard deviation, t-test and analysis of variance, and Pearson product moment correlation coefficient were utilized.

3. Results (Findings)

Table 1 shows the means and standard deviation values pertaining to pre-service teachers' self-efficacy levels in teaching thinking skills.

Table 1. Self-efficacy levels of pre-service teachers in teaching thinking skills

	N	\bar{X}	Sd
Self-efficacy levels of pre-service teachers in teaching thinking skills	263	86.63	13.151

As shown in Table 1, the arithmetic mean and standard deviation of participants' (N=263) self-efficacy in teaching thinking skills scores was 86.63 and 13.151, respectively. These results suggest that education given in the first and second years of the education faculty laid the foundations for the teaching of thinking skills.

Table 2 shows the results of independent samples t-test conducted to identify how participants' self-efficacy vary according to year of study.

Table 2. Independent samples t-test analysis of pre-service teachers' self-efficacy levels in teaching thinking skills and year of study

Year of study	\bar{X}	N	sd	Levene's Test (p)	t	sd	p
Third year	86.19	130	12.732	.385	-.530	260.545	.597
Fourth year	87.05	133	13.583				

As can be seen from Table 2, the self-efficacy level of third year-students ($X=86.19$) was lower than that of fourth-year students ($X=87.05$). However, no meaningful difference was found between the two years of study ($p>.05$). In elementary teacher education programs, courses about subject area teaching are mostly taught during the third year. Fourth year students learn about subject area teaching, and thus skills teaching, by way of practice. This may be the reason behind the higher arithmetic means obtained by fourth-year students. However, no meaningful difference could be observed between the two years of study.

Table 3 presents self-efficacy means and standard deviation values of participants in the factors of the scale.

Table 3. Self-efficacy levels of pre-service elementary teachers in the factors of the scale

Factors	N	\bar{X}	sd
Creating a classroom environment that fosters thinking (Factor 1)	263	36.02	5.157
Teaching higher-order thinking skills (Factor 2)	263	16.53	3.501
Teaching of transfer (Factor 3)	263	40.03	3.169
Recognizing how students think (Factor 4)	263	13.41	2.471

As shown in Table 3, the arithmetic means and standard deviation values of participants were 36.02 and 5,157 in Factor 1; 16.53 and 3.501 in Factor 2; 40.03 and 3.169 in Factor 3; and 13.41 and 2.471 in Factor 4, respectively. It may be concluded that the education offered in the first and second years of education faculties set the basis for the teaching of thinking skills, and that third and fourth year students feel more efficacy in the first three factors owing to their teaching practice studies in elementary schools. As Factor 4 involves an aspect that can be developed through personal contact with students, the result obtained was anticipated.

Table 4 shows the **results** of the **Pearson product moment correlation** conducted to determine the relationship between participants' self-efficacy in the scale factors and their **analytical, practical, creative and critical thinking levels**.

Table 4. The relationship between the scale factors and pre-service teachers' analytical, practical, creative and critical thinking levels

	Analytical	Creative	Practical	Critical
Factor 1	.233**	.153**	.204**	.176**
Factor 2	.175**	.117*	.129*	.141*
Factor 3	.169*	.131*	.183*	.216**
Factor 4	.262**	.141*	.239**	.170**

As presented in Table 4, meaningful results prevailed between all factors and thinking levels at the level .01. a high correlation was found between all factors and pre-service teachers' thinking levels. In factors 1 and 2, analytical thinkers found themselves more competent. Analytical thinking necessitates the systematic organization of the parts of a whole and the step-by-step planning of instruction. Factor 3 requires critical thinking, which is very similar to analytical thinking. Therefore, the self-efficacy perceptions of critical thinkers may be high in factor 3. As factor 4 involves interaction with students, a high level of self-efficacy perception is to be expected from practical thinkers.

4. Discussion

In his doctoral dissertation dated in 2008 and entitled "Evaluation of Self-Efficacy Levels of Social Studies Pre-Service Teachers in the Teaching of Thinking Skills", Kaya worked with pre-service teachers, as did İnan and Özgen (2008) in their article entitled "Evaluation of Mathematics Pre-Service Teachers' Views about their Competencies in Teaching Thinking Skills during Teaching Practicum". In both studies, the self-efficacy beliefs of preservice teachers about thinking skills were found to be sufficient. Gelen (2002) had teachers complete questionnaires for his study "Evaluation of Elementary Teachers' Efficacy in Teaching Thinking Skills in the Social Studies Course" and concluded that the participants reported sufficient self-efficacy beliefs. However, when he observed these teachers in the act of teaching, he noticed that they had either insufficient or entirely insufficient self-efficacy. While the present study found similar results to the three mentioned above, Gelen's observation results are worth considering.

Kaya (2008) found that social studies pre-service teachers' self-efficacy levels in teaching thinking skills did not vary by their age. This is in line with the result obtained in the present study.

As the scale used by Kaya (2008) was also used in the present study, a comparison by the factors of the scale in both studies yielded the similar result that teachers were quite sufficient in the factors of creating a classroom environment conducive to thinking and of teaching transfer. In Kaya's study, social studies pre-service teachers found themselves quite sufficient in the teaching of higher-order thinking skills while pre-service teachers found themselves somewhat sufficient in this factor. The results of the present study regarding factor 4 corroborate Kaya's finding that preservice teachers found themselves somewhat sufficient in recognizing how students think.

Kaya (2008) found weak relationships between social studies pre-service teachers' self-efficacy levels in teaching thinking skills and their self-awarded analytical, practical, creative and critical thinking scores. However, the present study found strong relationships between elementary pre-service teachers' self-efficacy levels in teaching thinking skills and their self-awarded analytical, practical, creative and critical thinking scores. However, in both studies, a relationship was observed between self-efficacy levels in teaching thinking skills and the analytical, practical, creative and critical thinking scores that participants gave themselves.

5. Conclusion and Recommendation

It was concluded that participants found their self-efficacy in teaching thinking skills quite sufficient, and that their self-efficacy did not vary by year of study. Also, when the self-efficacy of participants was examined in relation to the factors of the scale, it was seen that they reported quite sufficient self-efficacy in factors 1 and 3, and somewhat sufficient self-efficacy in factors 2 and 4.

The analyses conducted to establish the relationship between the factors in the scale and preservice teachers' thinking levels (analytical, practical, creative and critical) revealed that as their reported self-efficacy levels in teaching thinking skills increased (decreased) in the factors of the scale, their analytical, practical, creative and critical thinking levels also tended to increase (decrease). A strong relationship was found between the factors of the scale and thinking levels.

In light of these findings, the following recommendations may be made:

- Practicum instructors should encourage pre-service teachers to use thought-provoking activities that enable students to discover their thinking styles in all their practices at elementary schools, and
- As Gelen's questionnaire and observation results varied significantly, the findings of the present study should be confirmed through observation.

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