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TENDENCIES IN STUDIES DONE WITH SCIENCE TEACHER CANDIDATES IN TURKEY*

Ebru ALTUN**
Sinan ÇINAR***
Sümeyye ERENLER****
Sema DEMİRCİ*****

Abstract

As a review study, this study was done to present what kind of studies were done with science teacher candidates, in which areas were studied and what kind of deficiencies were in years 2010-2015. In this scope ULAKBİM data base was searched by using "science teacher candidate" as key word and 160 articles that had been published in academic journals were reached. After examination of content of articles, 15 of them were eliminated that were out of the scope of subject and the research was achieved with 145 articles.

In the studies it was obtained that the subjects such as examining opinions, identifying metaphors, examining attitudes, determining misconceptions, identifying self-efficacy, were mostly examined. According to research results it was obtained that most of the studies done with teacher candidates at different levels were done based on quantitative approach and survey methods. It was also obtained that the general of studies done with survey method were towards examining of relation between different scales or comparison of teacher candidates from different branches in related scope. It was also found out that number of experimental studies or studies based on qualitative approaches were not many

Keywords: Science Teacher Candidates, Review Study, ULAKBİM.

1. INTRODUCTION

A report by TUBITAK (Scientific and Technological Research Council of Turkey) on publishing performance of Turkish universities covering the years 2004 to 2014 shows that 8.74 % of total scientific publications (228.856) were carried out in social sciences (20.011). In the social sciences, the highest number of scientific publications is seen in the field of Education, particularly Educational Studies (3.921). Carrying out of so many studies in education in the last decade has brought together different problems. Both in Turkey and the all around the world, the number of academic journals, congress and conferences in areas concerned, and the number of books published is increasing rapidly year by year. Researchers face difficult in reaching all of the studies on that topic, or spend too much time to reach them (Göktaş et al, 2012). This, in turn, naturally makes it more difficult for researchers from all areas follow the latest developments in their respective own discipline and maintain their level of awareness about the up to date knowledge (Erdem, 2011).

Continuous adding of new publications to the literature makes it quite challenging to follow the literature. In this regard, it is important to reveal a framework by examining under specific headings the studies in a selected special area. Such studies look at individuals, groups, institutions, methods and materials in order to describe, compare, contrast, classify, analyze and interpret the entities and the events that constitute their various fields of inquiry (Cohen, Manion & Morrison, 2007). These kind of studies can help researchers especially young researchers. In this context, educational research should be examined and organized at regular intervals, and identification of trends in the area is a guide to many scientists who study and intend to study in this area (Erdem, 2011; Çiltaş, Güler & Sözbilir, 2012; Göktaş et al, 2012; Selçuk et al, 2014, Ulutaş & Ubuz, 2008). It is seen that studies in many research areas are evaluated with content analysis in terms of topic, quality and quantity of the studies, and methods and techniques used; in this way, an attempt is made to determine trends in a certain area (Selçuk, Palancı, Kandemir and Dündar, 2014).

Present study was intended to set out a general framework for assessing the overall situation of the academic studies carried out regarding science teacher candidates in a certain period by considering various sub dimensions. For this purpose, answer was sought to the question "What are the general characteristics of the studies related to science teacher candidates in Turkey between 2010-2015?"

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**Res.Asst., Recep Tayyip Erdogan University Faculty of Education.

***Asst. Prof. Recep Tayyip Erdogan University Faculty of Education.

****Res. Asst. Recep Tayyip Erdogan University Faculty of Education.

***** Graduate student, Recep Tayyip Erdogan University Faculty of Education.

1.1. Method

Aim of this study it to examine in terms of subject, research methods, and data collection tools ultimately to put forward a framework for the overall situation of the studies carried out on science teacher candidates. So, this is a content analysis study. Purposes of content analysis as including the coding of open ended questions in surveys, the revealing of the focus of individual, group, institutional and societal matters, and the description of patterns and trends in communicative content (Weber, 1990).

1.2. Sample

In order to determine the studies to be covered in present study, the ULAKBİM data base was searched by using “science teacher candidate” as key word and 160 articles that had been published in academic journals were reached. After examination of content of articles, 15 of them were eliminated that were out of the scope of subject and the research was achieved with 145 articles

1.3. Data collection instrument

As a data collection tool, researchers developed a “Papers Classification Form” to examine the studies. The form included headings such as identity of the article, approaches and methods used, data collection tools and subject of the article. The data collection tool was developed in two stages. At first stage, the articles were examined and draft forms were developed by researchers. Then, the researchers convened to exchange their views about draft form. Necessary corrections were made and final draft was prepared accordingly. Once the final draft was ready, researchers conducted independent coding for a certain number of studies. Then, the codes were compared between researchers and differences were found. After causes for different coding were discussed, consensus was reached on the codes. Finally, all articles were coded by researches.

1.4. Data Analysis

The data collected with the “Papers Classification Form” were analyzed by using SPSS 22 software package. Necessary analyzes were conducted in accordance with the research problem.

2. RESULTS

In this section, the data obtained from the analysis of these studies were examined in relation with relevant main problem of the research. The data were interpreted in connection with sub dimensions in this study such as research topic, research methods, data collection instruments, and data analysis methods used in those studies.

The curve in the number of studies related to science teacher candidates over the years demonstrates that most studies were carried out in 2013 and 2014. Only 17 of the 145 studies examined were published in international journals, while 128 of them were published in national journals. In relation with language, 20 of the studies were authored in a foreign language, while the remaining 125 articles were written in Turkish.

Table 1: Descriptive characteristics of studies between 2010-2015

Year	Number of article	Journals		Language	
		National	International	Turkish	Other
2010	14	13	1	13	1
2011	21	17	4	19	2
2012	24	22	2	22	2
2013	38	36	2	32	6
2014	36	31	5	28	8
2015	12	9	3	11	1

In the context of examination of the studies regarding science teacher candidates, the articles were also analyzed for research approach applied in each study. The distribution of studies based on research approach is as follows:

Table 2: Distribution of studies on science teacher candidates by research design between 2010- 2015

Year	Case Study	Qualitative				Quantitative			Mixed methods research
		Phenomenography	Ethnography	Action Research	Experimental	Survey	Correlational		
2014	11	0	0	0	3	18	3	0	
2015	0	0	0	0	4	6	0	2	
Total	38	0	0	0	16	68	3	7	
2010	4	0	0	0	2	6	2	0	
2011	10	0	1	0	0	6	2	2	
2012	4	0	0	0	2	14	2	2	
2013	9	1	2	1	5	18	1	1	

Table 2 shows that of the 145 articles which were analyzed, 44 are designed with qualitative research pattern, 94 quantitative pattern, and 7 use mixed methods research. Considering research type, it is seen that 26,2 % of the studies are carried out as case study, 11,0% experimental study, 6,9 % correlational study and 46,9 % as survey. It can be said that almost half of the studies related to science teacher candidates in the last 5 years were carried out as a survey. The proportion of studies using mixed methods research accounts for 4,8 % of all studies carried out in the last 5 years.

Table 3: Data collection instruments used in studies related to science teacher candidates between 2010-2015

Data collection instruments	Frequency
Attitude/personality/ability/aptitude test	91
Interview	31
Achievement test	8
Others	15

When we look at the data collection instruments used in studies about science teacher candidates, it is seen that tests were used to measure traits such as attitude/personality/ability/aptitude etc in majority of the studies (62,8 %). In 21,4% of the articles, data were collected with interviews. Lastly, 10,3 % of the studies employed different other instruments including lesson plans, video recording, lecture notes, work sheets and diaries.

Table 4: Topics covered in studies on science teacher candidates between 2010-2015

Research Topic	Frequency
Identification of interest/attitude/self-efficacy	55
Comparison/evaluation of different approaches/methods/techniques	20
Identification of views on a subject matter/concept	21
Identification/comparison of perceptions	11
Evaluation of educational outcomes	5
Scale development study	6
Other	27

Distribution of the studies regarding science teacher candidates by research topic demonstrates that the weight is on identifying interest/attitude/self-efficacy (38%). On the other hand, 13,8 % of the studies were carried out for comparing/evaluating effectiveness of different approaches/methods/techniques, and 14,5 % for finding out of science teacher candidates about various topics.

3. CONCLUSION

This study aimed at putting forward a descriptive framework for the studies published in educational journals in ULAKBİM database carried out with science teacher candidates in the last 5 years and determining the trends and tendencies of the studies carried out in this area. It was found out that the number of studies in relevant areas increased over years, reaching the maximum number of publications in 2013. It was seen that only 11,7 % of those articles were published in international journals, while the rest of 88,3 % were published in national journals. Apart from that, 13,8 % of the publications examined were found to be authored in a foreign language, while 86,2 % are written in their native language. Although the number of studies is sufficient, most of them seem to be limited by national borders due to the language of the full text or national journals. Despite numerous academic publications in the field of education in Turkey every year, the number of citations they receive seems insufficient. In the report by TUBITAK, the average impact of the studies in the field of education is seen to be only 2,68. One of the reasons for such a low level of average impact might be the reduced access to these publications by non-Turkish speaking researchers due to the language of publication or indexing database.

64,8 % of the studies in related field are implemented as quantitative studies, whereas only 4,8 % used mixed methods research. Most of the quantitative studies were carried out as survey. As a quantitative research method, surveys are preferred owing to certain advantages such as short duration of implementation, being economical and allowing working with large sample groups. This finding seems consistent with the literature. In the literature, results of content analysis carried out in different areas reveal that quantitative research is used more often than other methods, particularly survey is seen to be the most frequently used example (Çiltaş et al., 2012; Göktaş et al., 2012; Alper & Gülbahar, 2009; Selçuk et al., 2014; Yalçın, Bilican, Kezer & Yalçın, 2009). As regards to qualitative studies, most of them are seen to be carried out to describe an existing case by examining in-depth, thus case study is more preferred than the other qualitative research designs.

When we look at the data collection instruments used in the studies, it is seen that the vast majority of them use attitude/personality/ability/aptitude etc tests. This finding does not seem surprising since most of the studies are designed as a survey. Similar results were also obtained from the relevant literature (Dođru, Gençosman, Ataalkın & Şeker, 2012; Göktaş et al., 2012; Şahin, Kana & Varışođlu, 2013; Selçuk et al., 2014; Yalçın, Bilican, Kezer & Yalçın, 2009). In 21,4 % of the studies, interviews were used to collect data. In 10,3 % of the studies, other data collection instruments were used such as lesson plans, video recording, lecture notes, work sheets, and diaries.

In the context of topic, majority of the studies are seen to aim at determining interests/attitude/self-efficacy. This is an expected result, which seems consistent with the literature. Another 13,8 % of the studies were carried out to compare or evaluate the effects of different approaches/methods/techniques, 14,5 % of the studies aimed at identifying views of science teacher candidates on different topics.

The studies regarding science teacher candidates carried out in the last 5 years, number of studies is sufficient; but, they seem to be limited in terms of diversity. In our study, studies which published in educational journals indexed by a certain database were investigated to set out a general framework. Descriptive analysis is an important procedure for identifying trends in the studies carried out in a specific area and providing an overall framework in that area. Therefore, similar studies are recommended to be carried out on other topics. Furthermore, future studies might be more useful in depicting trends in different areas by means of a more comprehensive examination of various databases and journals.

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