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Research Trends on Mathematical Problem Solving in Turkey : Master Thesis and Dissertations of 2006-2013 Period

Gunes Yavuz^{a*}, Yasemin Deringol-Karatas^a, Cigdem Arslan^a, Hatice Nur Erbay^a

^aIstanbul University Hasan Ali Yucel Education Faculty, Istanbul, Turkey

Abstract

One of the primary aim of education is to train individuals as problem solvers to overcome and face problems in life. Problem solving has been the hallmark of the era we are in and takes a vital place in the objectives of all courses in education. Therefore, many studies were carried on and is still being done. In this context, the purpose of this study is to shed light to the future researches about mathematical problem solving by making an overall assessment of masters thesis and dissertations in this subject in Turkey. For this purpose 65 master thesis and dissertations retrieved from the thesis centre in the Turkish Council of Higher Education (YOK) were examined. The study was limited to the years 2006-2013 and with the master thesis and dissertations including “problem solving” term in their title. Researches included in this study were investigated according to the research methodology, publication year, publication type, sampling type, institution of the author and thesis’s/dissertation’s director’s title. The results of the analysis would help researchers to see the current research trends and provide insight into future research related to problem solving.

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1. Introduction

One of the primary aim of education is to train individuals that can be overcome the problems they have to face

* Gunes Yavuz. Tel.: +90 0212 440 00 00/26044 ; fax: + 90 0212 513 05 61.
E-mail address: gyavuz@istanbul.edu.tr

in life in the future. Problem solving that have marked the era we are in, take part objectives of all courses in programs. Therefore, the studies about the structure of the problem, problem solving and developing success in problem solving by many educators and psychologists are increasing (Kilic & Samanci, 2005).

Morgan (1995) defined the problem as a conflict situation in which individual have to encounter frustration to achieve a goal. There are 2 product of problem solving in math education. First one is evolution of specific strategy and rules; second one is evolution of finding usable thinking ways of formula and general approaches. Students learn the way of solving problems by studying on problems, create new strategies and organize strategies which are given to them. In this type of math education, cognitive and operational knowledge are merged (Orhun & Toluk, 2004). In operational information, usage of notion and process are important but reasons are not needed; however, in cognitive knowledge, comprehension comes forward (Baki, 1997). Also in solving problem comprehension is important and it works for cognitive knowledge digits. Thus, cognitive scientists' opinion in problem solving that comprehension and insight are important. In solving problems, individual's past life is important (Kennedy, 1980). In math, permanent and operational learning is possible only by balancing of operative and cognitive knowledge (Baki, 1998).

In math, way of success is related with good problem solving. For teaching and learning of math lessons, way of problem solving process is important. Because of problem solving is one of scientific method, it requires critical thinking, creative and reflective thinking, usage of analyze and synthesis abilities. Owing to solving problems is the center of math curriculum; this topic has different importance for math academicians. Understanding mathematical knowledge and association of information are occurs in problem solving processes (Swings & Peterson, 1988). Therefore, math academicians are concurrence in improving problem solving abilities of students and make this main purpose (Karatas & Guven, 2004). Problem Solving includes coordination of various abilities, beliefs, attitudes, heuristics, knowledge and combination of past knowledge.

In this context to determine research trends on problem solving is important. Knowing recent studies can help researchers about new topics on problem solving. The aim of this study is to shed light to the future researches about mathematical problem solving by making an overall assessment of masters thesis and dissertations between 2006 and 2013 in Turkey. The research questions are as followed:

1. What is the frequency of master theses and doctoral dissertations according to research methodology with respect to their publication type?
2. What is the frequency of sampling type of master theses and doctoral dissertations with respect to sample size?
3. What is the frequency of master theses and doctoral dissertations according to their publication year?

2. Methods

In this study, research about mathematical problem solving between the years of 2006 and 2013 were analyzed in terms of various variables. For this purpose, master's theses and doctoral dissertations that are indexed by the Higher Education Councils National Thesis Center (YOK-UTM) were collected. Data was collected through document reviewing, one of qualitative research methods. Document reviewing includes examining written materials that bear information regarding the issue to be investigated (Yildirim & Simsek, 2005). The collect of the researches indexed in the Higher Education Councils National Thesis Center was made through their abstracts. Researches that were included in this study were investigated with regard to following variables: Publication type, publication year, research methodology and sampling type.

3. Results

Analysis of research methodology shows that 25 studies have used the quantitative research, 13 studies qualitative and 21 studies mixed (qualitative and quantitative) methodology. The analysis of research methodology according to their publication type and research methodology is seen in Table 1.

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