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Altıncı Sınıf Öğrencilerinin Kümeler Konusunda Kurdukları Problemlerin İncelenmesi

Analyzing The Problems About Sets Posed by The Sixth Grade Students

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Extended Summary

Employing case study approach, one of the qualitative research methods (Meriam, 1988; Stake, 1994), this study aims at describing the knowledge and problem posing skills of primary 6th grade students about the concept of sets. In this sense, the research data were collected via descriptive research analysis method. Descriptive studies are used to define the behaviors, attitudes, and achievements of a participant group and search for answers to the questions of what and how (McMillan and Schumacher, 2010). Considering the purpose of the present study, descriptive analysis method was deemed to be the most appropriate method for it.

In the study, a "problem posing test" including 4 items about the subject of sets was employed as a data collection tool. This test covers 4 open-ended questions. The questions which were prepared based on the literature were evaluated by three mathematics educators. Whether the problems in a prepared data collection tool are appropriate for the purpose of a measurement and whether they represent the area that needs to be measured are determined according to "expert views" (Karasar, 1995). Thus, a group of experts discussed whether or not the problems prepared based on the measurement purposes and the content analyses required by such purposes represented such purposes and contents.

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It was seen that the forms of expression of the questions posed by the students (through notation or verbally) change by question type. The students were able to pose problems for practice whereas they had difficulty in posing problems requiring high-level thinking skills. In this sense, the results of this study are similar to those of some studies on problem posing skills in literature (Crespo, 2003; Işık, 2011; Işık and Kar, 2012a). In the present study, another reason for the students to give incorrect answers to problem posing questions was seen to be conceptual deficiencies. In this sense, this study is similar to some other previous studies revealing incompetence resulting from conceptual deficiencies (Işık, 2011; Işık and Kar, 2012c). Another result obtained from the study is that students are not capable of using their creativity for problem posing. In this sense, it is possible to say that the study provides similar results to those of Van Harpen and Sriraman (2013) exploring the relationship between mathematical creativity and problem posing.

Apart from this study, there are other studies in literature dwelling on the exploration of the relationship between achievement or problem-solving skills and problem posing (Silver and Cai, 1996; English, 1998; Dede and Yaman, 2005); analyzing the development of problem posing skills in time (Lowrie, 2002); receiving opinions about problem posing capabilities (Akay and Boz, 2009); determining the space allocated for problem posing within curricula (Kılıç, 2011); and so on.Based on the study results, recommendations below are put forward:

- In curricula and in-class activities, more space may be allocated for problem posing studies that require the use of high-level skills such as association and creativity and reveal the relationship between mathematics and daily life.
- After the problems posed by students are analyzed and the incorrect problems are determined, these problems may be discussed during the class, which may eliminate the relevant conceptual errors and misconceptions possessed by students.

- Problem posing skills of pre-service teachers may be investigated. If there are deficiencies in problem posing skills, appropriate steps may be taken to eliminate such deficiencies.
- The difficulties encountered during the problem posing process may be identified through qualitative and quantitative methods, and experimental studies may be carried out to remove such difficulties.
- The problem posing skills of students may be analyzed on a larger sample group.
- Curricula, textbooks, teacher guidance books, and students' workbooks may be analyzed in terms of problem posing activities.
- The views of in-service teachers and pre-service teachers regarding problem posing may be taken.

How problem posing skills are improved within the learning process may be analyzed by allocating space for activities which can improve students' problem posing skills.

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