Smıt Öğretmeni Adaylarının Matematik Öz-Yeterlik Algıları ve Kimya Problemlerinde Matematik Kullanımına Yönelik Görüşleri
Pre-Service Classroom Teachers’ Opinions about Using of Mathematics at Chemistry Problems and Levels of Mathematics Self-Efficacy
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EXTENDED SUMMARY

Correct problem solving has an important role in succeeding in Chemistry courses. The most important problem encountered in solving algorithmic chemistry problems is that the deficiencies in terms of basic chemistry information and operational processes. The pre-service classroom teachers taking part in the first five classes of primary education should have in many academic fields according to the desired goals self-efficacy beliefs in teaching to be able to. Success is not simply based on the possession of necessary skills for performance; it requires the confidence to use these skills effectively. Self-efficacy refers to a belief in one’s ability to perform specific tasks. The belief of self-efficacy affects the perception, motivation and performance of a person. Motivation levels of individuals may determine their affective states, behaviors, how they attempt to deal with negative situation and how long they can deal with it. The belief of self-efficacy which is developed by Bandura has effects on the behavioral changes during the socialization process and on the student achievement.

The purpose of this study was to determine pre-service classroom teachers’ mathematics self-efficacy beliefs and their to take their views on ability of algorithmic chemistry problem solving by using math knowledge. In this work, the following problems were investigated:

Pre-service classroom teachers;
- What is the level of self-efficacy beliefs on mathematics?
- What are the interactions mathematics self-efficacy beliefs with gender, class, and high school types?
- What are the opinions on algorithmic chemistry problem solving by using adequate knowledge of mathematics?

Do mathematics self-efficacy belief levels change in algorithmic chemistry problem solving with mathematics?

In this study the correlative method was used. The sample of the study consisted of 170 pre-service classroom teachers at education faculty, department of primary education. Pre-services classroom teachers consist of 103 female, 67 male. The numbers of pre-services are 36 in 1st, 42 in 2nd, 41 in 3rd and 51 in 4th respectively according to classes levels. To determine self-efficacy beliefs of the pre-service classroom teachers, Mathematics Self Efficacy against Perception Scale (MSAPS) which was developed by Umay (2000) were used. The scale consists of three factors. These are: Mathematics self-perception, Awareness about the behaviors of mathematics, the conversion of mathematics to life skills. To take their views on ability of chemistry problem solving by using math knowledge, a questionnaire was developed by experts and applied. In data analysis, SPSS 13.0 was used. Scores taken from the scale, frequency and percentage tables of the questionnaire was interpreted.

According to the findings in this study, it was found that pre-services classroom teachers have high self-efficacy beliefs about mathematics. High levels of pre-service teachers’ self-efficacy beliefs can be seen as a sign proving that they can go forward integrating science and mathematics fields. Umay (2000) also found the similar result using the same scale (MSAPS) in her study.

In this research, female pre-services’ mathematics self-perception level is found higher than the males’ score. Similar results are also found by other researchers (Junge and Beverly, 1995; Pajares and Miller, 1994); however in some researches it is stated that mathematics self-efficacy perception shows no difference according to the gender (Cooper and Robinson, 1991). There is no significant difference between the scores obtained from Awareness about the behaviors of mathematics and the conversion of mathematics to life skills factors with the gender variable.

It was found that mathematics self-efficacy beliefs of pre-services change with classes. This change was all the sub-factors. In general, students’ self-efficacy beliefs of undergraduate education were positively affected. Cantürk-Günhan and Pirgayi póglu (2004), Morrell and Carroll (2003) and Umay (2002) found similar results in their work.

It was obtained that there is no significant difference between the scores obtained from Mathematics self-perception and Awareness about the behaviors of mathematics factors with high school types while there is significant difference between the conversions of mathematics to life skills factor points with high school variable in favor of Anatolia high schools. According to Terzi and Mirasidedioğlu’s (2009) and Umay’s (2000) studies, Teacher and Anatolia high school’s scores obtained from Mathematics self-perception factors were higher than in general high schools.

When the opinions of pre-services evaluated, it was determined that mathematical knowledge is essential near chemistry information to solve algorithmic chemistry problem. However, about half of pre-services have the opinions that “when solving algorithmic chemistry problems, I generally reach the wrong answer” and “I have difficulties when solving algorithmic chemistry that require more than operation”. This finding indicates that pre-services have anxiety in algorithmic chemistry problem solving with operations.