THE ROLE OF MODELING ON EFFECTS OF IRANIAN STUDENTS

Abolfazl Rafiepour Gatabi & Fereshteh Esmaili

Faculty of Mathematics and Computer & Mahani Mathematical Research Centre Shahid Bahonar University of Kerman, Iran- Email: Rafiepour@uk.ac.ir & Drafiepour@gmail.com

Master of Mathematics Education, Teacher of Mathematics, Tehran, Iran.

Abstract

In this study, twelve problem (4 modeling problems, 4 word problems and 4 pure math problems) used a pre-test and post-test for 92 grade 10 Iranian students to examining their effects(enjoyment, value, interest and self-efficacy) about different type of problems. There are three session teaching units between pre and post test as an intervention. Results of this study show that effects of students were improved.

Keywords: Modeling Activities- Effect- Enjoyment- Self efficacy.

In this study, 92 Iranian students (39 girls and 53 boys) in grade 10 participated. The main purpose of this study was investigating impact of modelling activities on effects (enjoyment, value, interest and self-efficacy) of students about different type of mathematical problems (Modelling problems, Word problems, and Pure Math problems). This study was in the line of German educators' research (Schukajlow, et al, 2011).

For data collection, we use questioner contain 14 problems- 4 problems were modelling, 4 of them were word problems and last 4 were pure mathematics problems. These problems come from research literature about modelling in the case of modelling problems, and from Iranian textbooks in the case of word and pure problems. This questioner was used in pre-test and post-test for assessing the effect of students. Between these two tests, there is an intervention. This intervention was containing 3 modelling activities (different with pre- & post- test) that teach to students in 3 ordinary classrooms session-about 75 minutes for each session.

In pre-test and post-test, students asked for self-reporting about 12 problems without solving these problems. This self-report tool comes from Schukajlow, et al (2011), and contains 4 statements for each 12 questions as below:

- I would enjoy after solving this problem....

- I think it is important to be able to solve this problem....
- It would be interesting to work on this problem...
- I am confident I can solve this problem...

Students asked to answer these statements with 5 point Likert scales contain strongly disagree; disagree; neither agree nor disagree; agree; strongly agree. These data used for SPSS. For data analysis, ANOVA, T-test and Pearson correlation was used. Other sources of data collection were classroom observation and semi-instructed interview with students.

Results of this study show that the effect of Iranian students about modelling problems was lower than other problems. While in Schukajlow, et al (2011) study, students have same effect about different type of problems. Iranian students have more enjoyment about word problems and pure math problems than modelling problems. They also have less self-efficacy about modelling problems than other two types of problems. These finding was different with Schukajlow, et al (2011) study. We think this different result is rooted in stronger background of German students in modelling activities in both research and practice.

Another interesting finding of our study was about Iranian students' opinion about modelling problems. They think these types of problems did not belong to mathematics. This finding is in the line with Rafiepour and Gooya (2010) research. Rafiepour and Gooya (2010) discuss about Iranian teachers' opinion about real world problems. In some cases, Iranian math teachers didn't believe to real world problem. Indeed, these Iranian mathematics teachers thought real world problems didn't belong to mathematics but belong to other field of knowledge like economy, biology and so on.

All students in their interview said they had enjoyed with modelling activities and they would like to have such activities in the official curriculum and textbooks.

References

Schukajlow, S. & Leiss, D. & Pekrun, R. & Blum, W. & Müller, M. & Messner, R. (2011). Teaching methods for modeling problems and students' task-specific enjoyment, value, interest and self-efficacy expectations. *Educational Studies in Mathematics*. DOI 10.1007/s10649-011-9341-2.

Rafiepour, A. & Gooya, Z. (2010). The Necessity and Direction of Educational Changes in School Mathematics Curriculum in Iran from Teachers' Perspective. *Journal of Educational innovation* (peer reviewed Journal in Persian Language). Vol, 33. Pp. 91-120. Iran: ministry of Education.