INTEGRATION OF SITUATIONAL IMAGES IN SOLVING LINEAR EQUATION PROBLEM

ANGEL CONSTANTINE A. BAJANA
COLLEGE OF ARTS AND HUMANITIES
UNIVERSITY OF THE IMMACULATE CONCEPTION
DAVAO CITY

THE PROBLEM

Problem solving is a common approach of concepts understanding in mathematics and science subjects. It bridges the concept to the real world by establishing its factual and realistic application. Students of mathematics and physical sciences were able to quickly grasp the idea because the setting is based on a real-life setup. Hence, there is a persisting problem among mathematics and physical science students regarding problem-solving such as the comprehension and abstraction of the situation into a mathematical representation. A student could not easily construct a situational picture of the problem due to the absence of experience in a particular setup. With these lapses, students' understanding of the problem situation is uncompromised, leading to misjudgment and an inability to relate to the concept.

According to Wheatley and Cobb (1990), problem-solving in mathematics is often a process of building from images to analysis and vice versa. Research conducted by Saundry and Nicol (2006) shows that the students use the picture as manipulatives, system support, and sophisticated representation and imagery. Hence, this action research is trying to determine the reaction and performance of the students in college algebra when image/picture is integrated into solving linear equation word problems.

THE METHODS

To determine if image integration significantly affects problem-solving, 138 randomly selected test papers from 690 math students of the University of the Immaculate Conception were taken as samples. The test questionnaire contained fifty multiple-choice items, but the study concentrates on four problem-solving things. Four were presented with images, and the others were delivered in word problem format. After the exam, the students from the four sections gave their comments regarding the test items. The comments were collated from the responses of the 138 students from the four different sections taking up mathematics in the modern world.

THE RESULT

The result shows that out of 138 student respondents, 75, or 54%, were able to answer item number 25, which is presented with a situational image, against 53, or 38%, who were able to answer the problem in number 26, which is given without the situational picture.

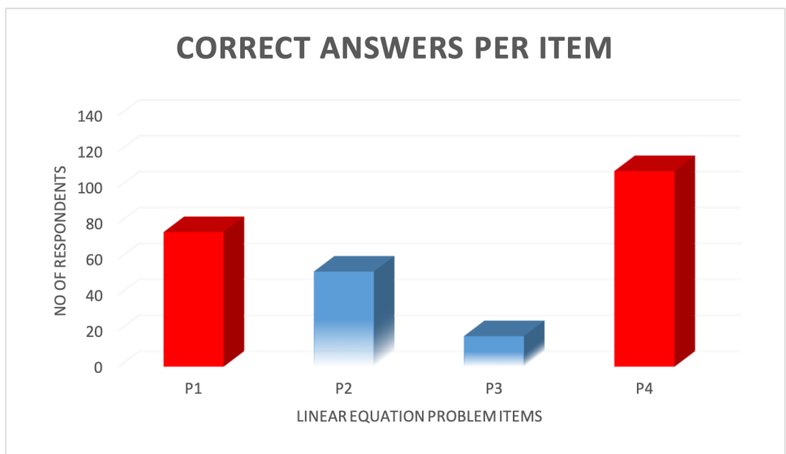

Table 1. Correct Answers per Item

In item number 29, a word problem alone, only 17 or 12% of the respondents were able to answer the item, whereas in item number 30, which was presented with an image, 109 or 78% were able to answer the problem.

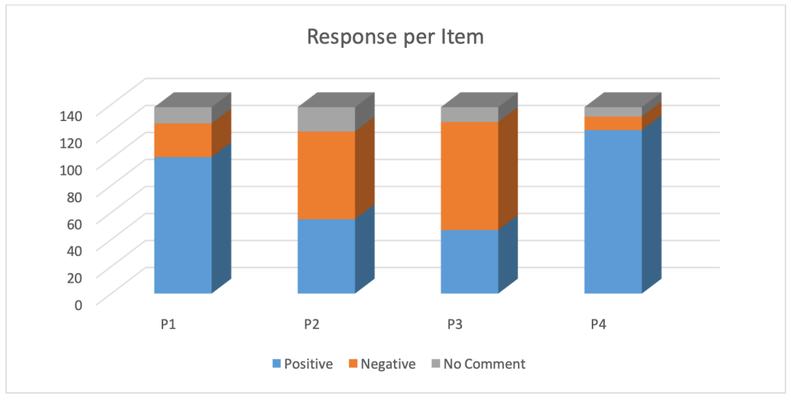

Table 2. Response per Item

CONCLUSION

Respondents' comments regarding the items were mostly appreciative regarding the images. Considering that the items involved were identified as moderately difficult items, most of the respondents says that they were able to easily analyze the linear problem due to the presence of illustration. Most comments regarding the linear problems without images were negative such as difficulty in comprehending the problems, inability to visualize the situation, and incorrect interpretation of the situations. Respondents mostly suggested that test items should have images that would help students easily visualize and analyze the problem.

REFERENCES

Wheatley, G. H. & Cobb, P. (1990). Analysis of young children's spatial constructions. In L. Steffe & T. Wood (Eds.) Transforming Children's Mathematics Education: An International Perspective. (pp. 161-173). Hillside, NJ: Erlbaum. Saundry, C., & Nicol, C. (2006). Drawing as problem-solving: Young children's mathematical reasoning through pictures. In J. Novotná, H. Moraová, M. Krátká & N. Stehlíková (Eds.), Proceedings of the 30thConference of the International Group for the Psychology of Mathematics Education (v. 5, pp. 57-63). Prague, Czech Republic: PME.