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## ABSTRACT

This study compared the cognitive and affective effects of the Context-Based and Traditional approach on voc-tech students taking the ladderized Bachelor of Industrial Technology major in Electricity/Electronics (BIT) and the fourth-year Bachelor of Science in Electricity/Electronics (BS Voc-tech) degree program. The study was conducted for twelve weeks and included units of instruction in fractions, decimals, percent, ratio and proportion, measurement and linear equations. Four intact classes of 27 students each at a state college in Western Visayas participated in the study.

Quantitative data were collected using a Pretest and Posttest examination in mathematics problem solving to assess the levels of students' problem-solving performance and an attitude, beliefs and confidence (A-B-C) questionnaire to assess the voc-tech students, attitude, belief and confidence. For qualitative analysis, the students' journals, interview responses, and the teacher observers' and raters' notes and comments were analyzed.

Based on the pretest of the mathematics problem-solving test and the A-B-C questionnaire, the results showed that the students have a very low analytic level and limited content knowledge in mathematics prior the intervention. However, the context-based approach, anchored on a constructivist belief, enhanced the students' problem-solving skills as exhibited by the numerically higher scores and improvement in the quality of the experimental class' solutions and responses to the problem-solving posttest. Also, the students had a neutral attitude towards problem-solving, a constructivist-traditional belief, and an average confidence level at the onset of the study.

After the treatment, analysis on the scores in the mathematics problem-solving test revealed that the context-based approach had a significant effect on the voc-tech students, but only on certain topics of mathematics in terms of *approach*, *program* and *ability* level. Results also revealed that the students who are exposed to the context-based approach showed a significant improvement in their attitude and beliefs in mathematics problem solving compared to their counterparts in the control group. In the addition, the BS students demonstrated a better problem-solving performance than the BIT students. Moreover, the voc-tech students scored significantly different across the 3 levels of ability, the mean scores ranked according to ability level, High > Average > Low.

Results also revealed that the experimental group experienced a significant improvement in their attitude and beliefs towards problem-solving compared to the control group. By program, the BS students have significantly higher *belief* and *confidence* scores than their BIT counterparts. Results further shows that both problem-solving ability and confidence

can positively and significantly predict and contributed significantly to problem-solving performance, with problem ability being a better predictor.

The qualitative analyses of the data revealed that the context-based approach was effective in enabling the students to be more creative, logical, organized and thorough in presenting their solutions. The following features of the Context-Based Mathematics Problem Solving (CBMPS) approach are most appreciated by a majority of students: the exposure to situational and realistic mathematics problems, the motivation and encouragement that the teacher gives them, and the ample time they provide with to analyzed, by themselves, the solution to a problem. These attributed of the context-based approach enabled the students to gain confidence in their ability to solve mathematics problems which, in turn, improved their overall performance in the subject.

To sum up, the context-based approach produced positive effects on mathematics problem-solving performance, attitudes, beliefs and self-confidence in mathematics problem-solving. Therefore, it is recommended and that this teaching approach be used in mathematics courses of voc-tech programs. Academic and shop teachers who teach voc-tech students should be given opportunities to interact and to collaborate with each other in choosing problems that are contextual, realistic and related to real-life situations encountered by voc-tech students for a more meaningful and deeper understanding of mathematics. The study may also be replicated using the different shop specialization course as well as in other academic disciplines to verify the results and establish a theory of practice for educating the voc-tech students. Finally, it is recommended that a training program in basic mathematics should be given for secondary school teachers who are teaching mathematics in barangay and barrio high schools to ensure their efficiency to equip their students with a solid foundation of basic mathematics and problem-solving.