Abstract

This study compared the level of mathematical problem solving skills of students exposed and not exposed to the situated-cognition teaching model. It used Non-Equivalent Control Group Design with two intact classes of first year engineering students conducted in a regular schedule of the same time slot and room; taught by the researcher. The contents included problems in Arithmetic, Advanced Algebra and Trigonometry using Semantic Differential Scale for Content Validation of the Pretest/Posttest and Formative Tests. Within the framework and delimitations of the study, the situated-cognition teaching model posted significantly better mathematical problem solving skills (p-value=0.023<0.05) than the conventional teaching model. This supported the theory of Choi and Hanaffin (1995) which underscores the importance of providing a more realistic way of conceptualizing a particular situation for the students to become better problem solvers. It is recommended that situated-cognition be used as a teaching model for enhancing the problem solving skills of the students, or used to complement the conventional model.

Keywords: problem solving, situated-cognition model, math problem solving

1.0 Introduction

This study focused on how to improve level of problem solving skills among engineering freshmen through a teaching strategy that strikes the connection between students’ learning environment to real-life scenario. In mathematics, the curriculum needs to be improved to make it relevant, interesting and challenging. The Institute of Education Sciences of the National Center for Education Evaluation and Regional Assistance, US Department of Education (2012) recommended that to ensure that students will understand the problem addressing issues that students might encounter with the problem’s context (real-life situation) and language shall be considered. In addition, problem solving requires creativity to understand the
scientific and technological concepts that are necessary in day to day life (Bell, 1980; Schoenfield, 1990; Taotaka and Okamoto, 1994). What is really the most important thing in life is to be able to solve day-to-day problems. Thus, mathematics teachers must prepare students for this reality.

The tendency of learners is to use knowledge and skills they acquire from formal learning, which sometimes hinder some of them from applying and transferring their learning to day-to-day real life situation. There seems to be a wall between the classroom learning and the outside experiences, making real-life problem solving a difficult task. This has something to do with poor retention and generalization, which consequently obstructs transfer of knowledge from one situation to another. Engineering courses require intensive application of the theories learned in solving real life problems. In this case, the ability of the students to solve mathematical problems with enough provision (by the teacher) of opportunities for transfer of learning to real-life situations is the ultimate goal for all mathematics teachers. It is observed that passing percentage in mathematics among engineering freshmen in Southern Leyte State University ranges only from 20-40 percent, which is much lower than expected since those who are admitted to engineering courses are inclined to mathematics. Wilson (1993) said, “Learning and knowledge are integrally and inherently situated in the everyday world of human activity”. This requires learning to be situated in the context in which it is taught. The context in which something is learned is very important. Choi and Hannafin (1995) stressed that for the students to become effective problem solvers, they must be provided with a more real way to conceptualize a particular situation as the zest of the situated-cognition teaching problem solving. Hence, this study tried to determine the effect of situated-cognition teaching on the problem solving skills among engineering freshmen in comparison with the conventional teaching.

2.0 Theoretical and Conceptual Framework

Choi and Hannafin (1995) cited situated-cognition theory as a potential teaching model, which promotes exploration and understanding of the use of knowledge. This model can help attain SLSU’s goal of producing globally competitive graduates. In
this model, the learner is able to explore possibilities for problem solving in the real world situations that practitioners will experience. They further mentioned that the situated-cognition teaching instructionally implies that learning is a social process wherein the students can observe how others solve a problem which may help them understand and refine their own approach. In addition, instruction should incorporate real-world problems and contexts and the learners have a control of their learning being part of the process. Lave (1993) stressed that the focus on the situatedness of meaning or content is shifted to the focus on communities and what it means to learn as a function of being a part of a community. This shift in the unit of analysis from the individual's context to the community context leads to a shift in focus from the learning of skills or developing understandings to developing a person who can knowledgeably interact with the other members of the community, with the former motivating, shaping and giving meaning to the latter.

Moreover, situated-cognition theory represents a major shift in learning theory from traditional psychological views of learning as mechanistic and individualistic, and moves toward perspectives of learning as emergent and social (Greeno, 1998; Lave & Wenger, 1991; Salomon, 1996).

Brown, Collins and Duguid (1989) were often credited with developing situated-cognition or situated learning theory. Collins (1988) defined situated learning as the notion of learning knowledge and skills in contexts that reflect the way they will be used in real life, which is similar to Choi and Hannafin’s (1995) viewed on situated-cognition theory. Thus, this theory encourages educators to immerse learners in an environment that approximates as closely as possible context in which their new ideas and behaviors will be applied (Schell & Black, 1997). Regarded as leaders in the situated-cognition movement, Lave and Wenger (1991), described learning as an integral part of generative social practice in the lived-in world. From their definition, generative implies that learning is an act of creation or co-creation; social practice suggests that at least a portion of learning time occurs in partnership with others; and lived-in world connotes real-world practices and settings that make learning more relevant, useful, and transferable.

As an instructional strategy, situated-cognition has been seen as a
means for relating subject matter to the needs and concerns of learners (Shor, 1987). Learning is essentially a matter of creating meaning from the real activities of daily living. Lave and Wenger (1991) emphasized that embedding subject matter in the ongoing experiences of the learners and by creating opportunities for learners to live subject matter in the context of real-world challenges, knowledge is acquired and learning transfers from the classroom to the realm of practice. They further mentioned that to situate learning means to place thought and action in a specific place and time involving other learners, the environment, and the activities to create meaning. A situated learning experience has four major premises guiding the development of classroom activities (Anderson, Reder, & Simon 1996; Wilson 1993). First, learning is grounded in the actions of everyday situations. Second, knowledge is acquired situationally and transfers only to similar situations. Third, learning is the result of a social process encompassing ways of thinking, perceiving, problem solving, and interacting in addition to declarative and procedural knowledge. Fourth, learning is not separated from the world of action but exists in robust, complex, social environments made up of actors, actions, and situations.

The situated-cognition theory uses cooperative and participative teaching methods as the tool of attaining knowledge. Cooper and Mueck (1990) defined cooperative learning as a structured, systematic instructional strategy in which small groups of students work together toward a common goal. This theory has two critical features namely; positive interdependence and individual accountability which fosters learning. Thus, this study was anchored on the theory of Choi and Hannafin (1995) that students become effective problem solvers if they are provided with a more realistic way to conceptualize a particular situation.

Figure 2 showed the theoretical and conceptual framework of the study. Related theories connected to the conceptual framework that support the situated-cognition theory of Choi and Hanaffin (1995) are presented. Highlights of these theories with an interconnection between and among them are also provided.

### 3.0 Methodology

This study employed a quasi-experimental design, specifically the Pretest-Posttest Non-equivalent
Control Group Design with the teaching method (situated-cognition model compared to the conventional teaching model) as the independent variable. The mathematical problem-solving skills of the students was the dependent variable. Deeper descriptions on the effect of the intervention on the mathematical problem-solving skills of the students were also deduced from the students’ written comments and reflections about the lessons, how and how much the students learned. Three stages were followed in the implementation of the intervention.

**Pre-Instruction Stage**

During the pre-instruction stage, pre-assessment was done by administering the pretest to the
respondents. Since high school grades in mathematics, the English proficiency test and interview were done before enrolment, students were more or less comparable in mathematics ability. These were the screening stages for students who would like to take engineering and other degree courses offered in the university. The two groups of freshman engineering students, CE and EE & ME were randomly assigned to either the experimental group or control group. The prêt-est was prepared beforehand which underwent critiquing and content validation prior to its use. The items were taken from topics in Arithmetic, Advanced Algebra and Plane Trigonometry.

Meanwhile, lesson plans for the selected topics taught in the experiment were prepared. Two topics from Arithmetic, six from Algebra, and five from Plane Trigonometry were prepared with two teaching sessions per topic, except Quadratic Equation and Age Problems which called for three sessions each. Altogether, 28 teaching plans were prepared for the experimental group. The topics in Arithmetic included Percent and Simple and Compound Interests. In Advanced Algebra, the topics were: Quadratic Equations, Age Problems, Work Problems, Mixture Problems, Uniform Motion Problems involving Winds and Water Current, Arithmetic and Geometric Progressions. In Plane Trigonometry, the topics were Angles of Elevation and Depression, Bearings, Oblique Triangle using Right Triangle and vice versa, Oblique Triangles Using the Law of Sines and Cosines, and Checking Solutions of Oblique Triangle using Mollweides’s Equation. Two intact classes were considered with the same time per three-unit subject (three hours a week or one and half hours per session, two sessions per week) which were conducted during the regular school days. Permissions for the inclusion of the enrichment mathematics class in the regular class schedule and for using room in the engineering building were obtained from the Head of the Engineering Department.

**Instruction Stage**

After the preparation of the teaching materials and the research environment, class instruction employing the situated-cognition model and the conventional model was done for three months and 14 days conducted in the same time slot (1:00-2:30PM) and the same room. A total of 42 hours of instruction was undertaken, with one and half
hours per scheduled session for each of the two groups. Assessments were done after the discussion of a topic to monitor the development of each lesson and the formative development of the problem solving skills of the students based on Polya’s framework. Journal writings were also encouraged and solicited from the respondents to determine how much the students know and feel; and the effort they exerted in doing the tasks.

Post-Instruction Stage

After the 42-hour instruction, a test was administered to both groups to determine if improvements in the mathematical problem solving skills of the group differed significantly. The performance of the students was assessed analytically and holistically by two raters to cross validate the ratings. The journals were analyzed qualitatively, focusing on the students’ comments or reflections about the lesson.

The scoring of the pre-test/post-test was based on Charles’ scoring procedure (1987). However, the descriptions of each of the scores are based on Polya’s (1957) framework. The scoring rubric used was as follows:

0 Point – No Effort to

Understand the Problem

Does not show any indications of effort to understand or solve the problem.

1 Point - Understanding the Problem

The answer booklet reflected some understanding of the problem such as labeling, identifying the unknowns, conditions and data; and determining the solvability of the problem but an inappropriate strategy was chosen.

2 Points – Devising the Plan

The answer booklet revealed the formulation and use of an appropriate strategy or solving technique but was not pursued sufficiently to arrive at the correct answer or the strategy was not correctly carried out.

3 Points – Carrying Out the Plan

An appropriate strategy was used but an incorrect answer was reached; or the correct answer was given but was incorrectly labeled; implementation of an appropriate strategy was not
totally clear; or a computation error was made in carrying out the appropriate strategy.

4 Points – Looking Back
An appropriate strategy was chosen and successfully applied and the correct and complete answer properly labeled. There was evidence of correctness of the solution and reasonableness of the answer.

For the impressions about the teaching model, students were asked to write journals either after or as part of a formative test or an assignment. The analysis of the journals focused on the comments of the students about the teaching method and the progress of their learning based on the following questions and/or statements:

What can you say about the teaching method used?

Does it help you learn how to solve problem? In what way?

Describe the teacher-to-student and student-to-student interactions during the teaching-learning process?

Compare these with the interactions that occur in your other class.

This study determined the problem solving skills and problem solving performance of the students in mathematics. The quantitative data were gathered from the ratings in the pre-test and post-test. Qualitative analyses of the solutions of the students in the different tests both in mathematics were based on the four phases of Polya’s (1957) framework. Each phase was described. Meanwhile the qualitative analysis of the journals of the students was based on the questions which served as the focus of their journal entries. The student-to-student and teacher-to-student interactions were qualitatively analyzed based on the audio-taped and video-taped discussions and on the journals.

The quantitative analysis of the data used the following statistical tools: frequency counts and percentages were used to describe the two groups in terms of the problem-solving skills in mathematics and in other domains; mean was employed to determine the average or typical score of the respondents in the problem tests; Pearson’s r Product-Moment Correlation Coefficient was used to determine the degree of agreement between the two raters of the pretest
and post-test; Wilcoxon Signed Ranks Test was utilized to determine if improvement in the level of mathematical problem solving skills of the students are significant or not after exposing them to the situated-cognition and conventional models of teaching; and Kolmogorov-Smirnov Two-Sample Test was employed to determine if there is a significant difference on the level of problem solving skills between the students exposed and not exposed to the situated-cognition model of teaching.

4.0 Results and Discussions

On the Level of Mathematical Problem Solving Skills

A. Pretest and Posttest Results

Table 1. Raters’ degree of agreement on the pre-test and post-test ratings.

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>Comparison of Raters</th>
<th>Pearson’s r Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>Pretest</td>
<td>Rater 2 vs Rater 1</td>
<td>0.801**</td>
<td>Very High Agreement</td>
</tr>
<tr>
<td>Control Group</td>
<td>Posttest</td>
<td>Rater 1 vs Rater 2</td>
<td>0.977**</td>
<td>Very High Agreement</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>Pretest</td>
<td>Rater 2 vs Rater 1</td>
<td>0.477**</td>
<td>Moderate Agreement</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>Posttest</td>
<td>Rater 1 vs Rater 2</td>
<td>0.931**</td>
<td>Very High Agreement</td>
</tr>
</tbody>
</table>

** = Correlation coefficient is significant (p<.01; 2-tailed)

The pre-test and post-test data on the mathematical problem solving skills of the students were described. Table 1 showed the raters’ degree of agreement in the raters’ ratings on the pre-test and post-test in both the control and experimental groups, using the Pearson-Moment Correlation Coefficient.

Very high relationships or degree of agreements were observed in the pre-test-control (0.801), post-test-control (0.977) and post-test-experimental (0.931). Meanwhile, the coefficient of agreement of the raters in the pre-test-experimental group scores is moderate. All the coefficients of agreement were highly significant (p<.01).
Results indicated that there were very high degree of agreement between the raters’ ratings.

The mathematical problem solving skills of the students before and after the intervention were shown in Table 2. Before the intervention, the students in the conventional and situated-cognition teaching models had the same mathematical problem solving skills. Only one out of 14 problems was solved until the third phase of Polya’s framework, which is “Carrying out the plan”. This further indicates that on the average, the students in both groups displayed “No effort to understand the problem” for the 13 out of 14 problems given.

Table 2 further showed that after the intervention, students in the conventional teaching group were able to work on solving problems on an average in two out of 14 problems until the fourth phase “Looking Back” of the framework. This implies that these students had checked the correctness of the solution on an average in two problems out of the 14 problems in the posttest. Meanwhile, the students who were taught through the situated-cognition model solved three out of the 14 problems up to the fourth phase, which was better than what the students under the conventional teaching method did.

Table 2 also revealed that the mathematical problem solving skills of the students after the intervention were better in the group taught using the situated-cognition method than the conventional method. This is

Table 2. Students’ mathematical problem solving skills before and after the intervention (based on Polya’s Framework).

<table>
<thead>
<tr>
<th>Teaching Model Used</th>
<th>Before the Intervention</th>
<th>After the Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phase 0</td>
<td>1</td>
</tr>
<tr>
<td>Conventional (C)</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Situated-Cognition (SC)</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Difference (SC-C)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
illustrated in the positive difference between the mathematical problem solving skills of the students in the experimental group versus the conventional group. This was seen from phase 1 until phase 4 of Polya. It indicated that the students taught using the situated-cognition model are better in understanding the problem, devising a plan, carrying out the plan and looking back at the mathematical problems solved than students taught using the conventional model. These results supported the theory of Choi and Hannafin (1995) that students will become effective in solving problems if they are provided with a more real way of conceptualizing a problem.

**B. Formative Test Results**

Formative tests were administered after the discussion of a certain topic to monitor the progress of the students in the enrichment math class. As in the case of the pre-test/post-test results, the formative tests composed of 30 problems solved by the students were rated by two raters. Table 3 showed the degree of agreement of the raters’ ratings of the 30 mathematical problems solved by the students as indicated by the Pearson-r Product Moment Correlation Coefficient.

As revealed, the relationships or degrees of agreement between the ratings in both the control (0.906) and experimental (0.893) groups were very high. These correlation coefficients were found significant at the 1 percent level for two-tailed test. This means that the two raters had the same understanding on how to rate the formative tests, based on the rubrics adopted from Charle’s (1987).

<table>
<thead>
<tr>
<th>Group</th>
<th>Comparison of Raters</th>
<th>Pearson’s r Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>Rater 1 vs Rater 2</td>
<td>0.906**</td>
<td>Very High Agreement</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>Rater 2 vs Rater 1</td>
<td>0.893**</td>
<td>Very High Agreement</td>
</tr>
</tbody>
</table>

** - Correlation coefficient is significant (p<0.01; 2-tailed)
Table 4 revealed the mathematical problem solving skills of the students during the intervention based on the results of the 14 formative tests. These 14 formative tests were composed of 30 mathematical problems distributed across the three domains of Arithmetic, Advance Algebra and Plane Trigonometry.

The students under the situated-cognition teaching model had better mathematical problem solving skills at all phases of Polya’s framework than the students under the conventional teaching model. There were 10 more students in the experimental group who showed understanding of the problem than in the control group. In phase 2, nine more students were able to devise a plan to solve mathematical problems in the experimental group than in the control group. Further on, there were six more students in the experimental group who were able to carry out the plan to solve mathematical problems compared with the control group. Finally, two more students in the experimental group showed that they checked the correctness of their answers by looking back.

C. Within-Group Comparison of Pretest and Posttest Results

The pre-test and post-test results within the control and experimental groups were compared in table 5. The Wilcoxon-Signed Ranks test showed that the p-values of the pre-test vs. post-test in both the control and experimental groups were less than 0.01. This means that there was a very significant improvement in the mathematical problem solving skills of the students as observed in the post-test compared with the pre-test results. This leads to the rejection of the null hypothesis that there is no
significant improvement in the problems solving skills of the students exposed to the situated-cognition teaching model. This improvement was attained by the students taught using the conventional model and those under the situated-cognition model of teaching.

Furthermore, the results presented in table 5 indicated that the students in both groups had gained knowledge and improved their mathematical problem solving skills after exposing them to the intervention. The null hypothesis concerning the improvement in the mathematical problem solving skills after exposing the subjects to the situated-cognition and conventional teaching models was rejected.

Table 5 also revealed that the post-test mean score of the students in the experimental group (22.52) was better than those of the control group (15.31). Although significant increases in the mean scores from pre-test to post-test were observed in both groups, the results were still very far apart from the perfect score of 56 points. This implies that there is still a need to improve the performance of the students and the situated-cognition teaching model can help attain such goal.

D. Between-Group Comparison of Pretest and Posttest Results

The pre-test and post-test results between the students exposed to the conventional and situated-cognition models of teaching were compared to determine whether or not there was a significant difference in these measures.

There was no significant difference (p-value = 0.984>0.05) in the pre-test results of the control and experimental groups Table. The results conformed data in table 4 which show that the average

Table 5. Comparison of pre-test and post-test results within-group.

<table>
<thead>
<tr>
<th>Groups and Test Compared</th>
<th>Posttest Mean Score</th>
<th>Statistical Tool Used</th>
<th>Mean Rank</th>
<th>Sum of Rank</th>
<th>z-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test vs Post-test (Control)</td>
<td>15.31</td>
<td>Wilcoxon-Signed Rank Test</td>
<td>13.5</td>
<td>351</td>
<td>4.461**</td>
<td>0.000</td>
</tr>
<tr>
<td>Pre-test vs Post-test (Experimental)</td>
<td>22.52</td>
<td></td>
<td>15</td>
<td>435</td>
<td>4.783**</td>
<td>0.000</td>
</tr>
</tbody>
</table>

** - Results are significant (p-value<0.01, 2-tailed)
numbers of problems successfully done by the students in each phase of Polya’s framework were the same in the two groups, indicating that the students in the two groups had the same mathematical problem solving skills at the start of the experiment. These further imply that the enrolment committee of the Engineering department and the Office of Student Services enforced the implementation of the admission requirements for the students who would like to take engineering. The condition regarding the mathematics grade in high school as one of the requirements was strictly observed.

The posttest results in Table 6 show a significant difference in mathematical problem solving skills in favor of the experimental group (z-value = 1.493, p-value = 0.023 < 0.05, one-tailed). The experimental group had higher posttest mean score (22.52) than the control group (15.31).

Table 6. Comparison of pretest and posttest between-groups.

<table>
<thead>
<tr>
<th>Test Compared</th>
<th>Mean Score</th>
<th>Statistical Tool Used</th>
<th>z-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control Group</td>
<td>Expl. Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>3.3</td>
<td>3.4</td>
<td>Kolmogorov-Smirnov</td>
<td>0.459**</td>
</tr>
<tr>
<td>Posttest</td>
<td>15.31</td>
<td>22.52</td>
<td>Two Sample Test</td>
<td>1.493*</td>
</tr>
</tbody>
</table>

* - Result is significant (p< 0.05; 2-tailed)  
** - Result is not significant

Qualitative Analysis

**On Question 1: What can you say about the teaching method used?**

Some of the students in the control group focused their answers on how the lesson was carried out in the class. They even mentioned the benefit they gained from the enrichment math class insofar as problem solving is concerned. One student said that the method was helpful in solving mathematical problems. He pointed out that the flow of the discussion was from simple to complex, which requires analysis. The same comment was elicited from JEC26, who said that there was a step-by-step process of teaching which made him understand the lesson better. JEC19
and JEC10 pointed out that the method used in their class was the same as in their other subjects. This is true because the teaching model applied in their group is the conventional model, which the teachers in the department are commonly using.

A more formal comment was written by JEE9 (Journal Entry, Experimental Group, Student #9) who said that he never expected that the method used in the experimental group which was the situated-cognition teaching model could help him and the rest of the class much and they learned more. He added that he appreciated the teaching method used.

Another student from the experimental group, JEE16, said that the teaching method used in enrichment math was good even if the subject was not found in the syllabus, that he really learned a lot in the subject. In addition, JEE8 and JEE10 gave substantial remarks about the situated-cognition teaching model used in the experimental group. JEE8 pointed out that the method helped him to learn solving problems, which changed his perceptions that math is useless especially those problems dealing with variables. Meanwhile, JEE10 appreciated the use of math in student life, like budgeting weekly allowances. This journal was written after the topic on Compound and Simple Interests and Percentages.

**On Question 2: Does it help you learn how to solve the problems? In what way?**

To the second question, students in both groups gave almost the same answers which focused on the systematic and well organized approach for solving mathematical problems (through Polya’s framework). JEE15 said that the situated-cognition model trained the students to solve problems using their own strategy, while JEC 21 believed that the teaching method in the control group helped students to learn to love solving and interpreting problems through this framework.

A different remark written by JEE4 was that the situated-cognition teaching model helped a lot not only “in the inside-campus” but also in everyday living. JEE17 added that the method is a big help to him and his classmates for the Licensure Examination in Engineering.

**On Statement 3: Describe the teacher-student and student-student interactions during the teaching learning process.**
Regarding statement 3, one student in the control group (JEC14) said that the teacher-student and student-student interactions were somewhat like those in the ordinary class or other classes. This was quite different from the comment of JEE18 who described the interaction to be “pretty nice” that it did not only help them to learn something but also to learn how to work as a group, how to interact well with the teacher and with their classmates. JEC12 observed that in his group, some students participated while the others did not but, JEE28 said that all of them in the experimental group were interacting because to the group activity.

**On Statement 4: Compare these with the interactions that took place in your other class.**

All students in the control group pointed out that the interactions that occurred in their class were the same as those in the other subjects (JEC1, JEC23, JEC19 and JEC15). The students in the experimental group cited different interactions in their Enrichment math; that in the other subjects, when the teacher discussed the lesson, the students only listened until the period was over (JEE25 – Exhibit 45). JEE1 and JEE30 added that they cannot approach their teacher and classmates when there were confusions. In the situated-cognition teaching model, the class enjoyed and excited, and friendships were developed because of group cooperation (JEE17), that they performed some of the activities outside or in the field, like using the transit and steel tape in actual measurement of angles and distances (JEE18).

**5.0 Conclusions**

Students from both the control and experimental groups improved their mathematical problem solving skills from pre-test to post-test. However, there was a significant edge of the group using the situated-cognition model. Therefore, the situated-cognition model of teaching can help improve the problem solving skills in mathematics or can be used to complement the conventional model. Teacher-student and student-student interactions occurred significantly more interesting in the situated-cognition teaching model than in the conventional model. The former affected a more conducive atmosphere for interactions than the latter. The students in the situated-cognition teaching model realized the importance of mathematical
problem solving skills not only in the classroom but also in their future endeavors to become engineers and in everyday living. These are necessary intrinsic motivations that can greatly help students become successful in their studies and chosen field of interest. It is therefore concluded that sharing of ideas between teacher and students and among the students themselves and making relevance in mathematics learning is more favorable in the situated-cognition model than in the conventional model.

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