

**EFFECTS OF WRITE-PAIR-SHARE TEACHING APPROACH ON THE ALGEBRAIC
EXPRESSIONS PERFORMANCE OF ENGINEERING AND COMPUTER SCIENCE
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ABSTRACT

The main objective of this study was to determine the effects of write-pair-share teaching approach on the algebraic expressions performance of engineering and computer science students. Using the pretest-posttest experimental design, 60 students were involved and divided into control and experimental groups. Each group had 30 respondents. The control group was taught using traditional approach while the experimental group was taught using the write-pair-share approach.

The finding of the study revealed that there is a difference in the result in terms of algebraic expression performance. The control group had average level performance while the experimental group had a very good performance. However, during the posttest, the control group had a “very good” performance while the experimental group had an “excellent” performance. Results obtained by students during the quizzes/weekly test and posttest showed that there is a significant difference in student performance both in the control and experimental groups. The paired comparison between the quizzes and posttest scores of students in control group showed a significant difference in the students’ performance. It was also true to the paired comparison of the quizzes and posttest performance of students in the experimental group. With the aforementioned findings, students are encouraged to be aware of the teaching approach that could improve their intellectual capability and to take active role in their learning. Instructors should integrate these strategies in classroom instruction to improve the effectiveness of the teaching-learning process. Future researchers are also encouraged to undertake research of the same nature in order to obtain valid basis for generalization and conclusion.

INTRODUCTION

Mathematics is a way to understand the world and writing is a way to understand Mathematics. Peterson (1984) stressed that Mathematics is probably the most avoided subject in all grades and all year levels because of its complexity in terms of numbers, figures, formulas, derivations, equations and many others that any student or learner for that matter, in general sense, seems to be apprehensive when taking the course.

In such a world, those who understand and can do mathematics will have opportunities that others do not. Mathematical competence opens doors to productive futures. Principles and Standards for School Mathematics describe a future in which all students have access to rigorous, high-quality mathematics instruction. Knowledgeable teachers have adequate support and ongoing access to professional development. The curriculum is mathematically rich, providing students with opportunities to learn important mathematical concepts and procedures with understanding.

The vision of mathematics teaching and learning is not the reality in the majority of classrooms, schools, and districts. Today, many students are not learning the mathematics they need. In some instances, students do not have the opportunity to learn significant mathematics. In others, students lack commitment or are not engaged by existing curricula. Attaining the vision laid out in *Principles and Standards* will not be easy, but the task is critically important.

The students must be provided with the best mathematics education possible, one that enables them to fulfill personal ambitions and career goals in an ever-changing world.

Writing is a natural process, a method of communication between people and a way to express the thoughts and feelings that occur within a person. Its use as a tool for the teaching and learning of mathematics is a recent development; writing is now in use in mathematics classes.

Through the use of writing in the mathematics classroom, students can clarify their thinking, recognize and appreciate the connection between mathematics and other disciplines, and communicate their thoughts, ideas, and understanding about the subject with other students. Writing provides an alternative mode of learning for those creative students who have not previously been reached by more traditional, structured, linear methodology. Because a student often knows more than he or she can explain verbally, writing helps the student to uncover more of what is known and to express it. Once the students have had the opportunity to collect their thoughts on paper, they may then volunteer to share their work.

The above-mentioned scenario is an indication that there is a need to innovate and incorporate new teaching strategy using write-pair-share approach. A variation of think-pair-share, in which it gives students a chance to write down their answer before discussing it with their neighbor.

This study focused to determine the effects of write-pair-share teaching approach to the computer science and engineering students.

This study was limited only to the first year engineering and computer science students in which the expectations set by the college is made clear that at the end of the semester, the student is expected to demonstrate and acquire mathematical skills especially in college algebra.

METHODS

The pretest-posttest experimental group design was used in this study which focused in finding out the effects of write-pair-share teaching approach among engineering and computer science students. The instrument used in this study was a teacher-made test which served as pretest and posttest. It consisted of 50 items which contained the following topics: addition, multiplication and division of algebraic expressions, special products, factors and factoring, simplification, addition, multiplication and division of fractions.

The venue of this study was at the Naval State University, Naval, Biliran.

The subjects of this study involved sixty (60) Computer Science and Engineering Students taking college algebra. Respondents were paired or twinned based on the pretest score and student's profile in terms of gender and age. Thirty students belonged to the experimental group and were exposed to write-pair-share approach and another thirty students belonged to the traditional method.

The researcher personally administered the experiment since she was the subject-teacher of the respondents. Student's performance in the tests was recorded and personal interviews with selected students were conducted. Data were collated, tallied, analyzed, interpreted and presented in tables; the statistical tool used were frequency, percentage, mean and t-test to find the significant difference between the variables of the study.

RESULTS

The pretest scores between the control and the experimental groups have the same mean which is 25.6, standard deviation (SD) 6.724 and frequency of each score as it was the basis for pairing or twinning of the respondents of each group.

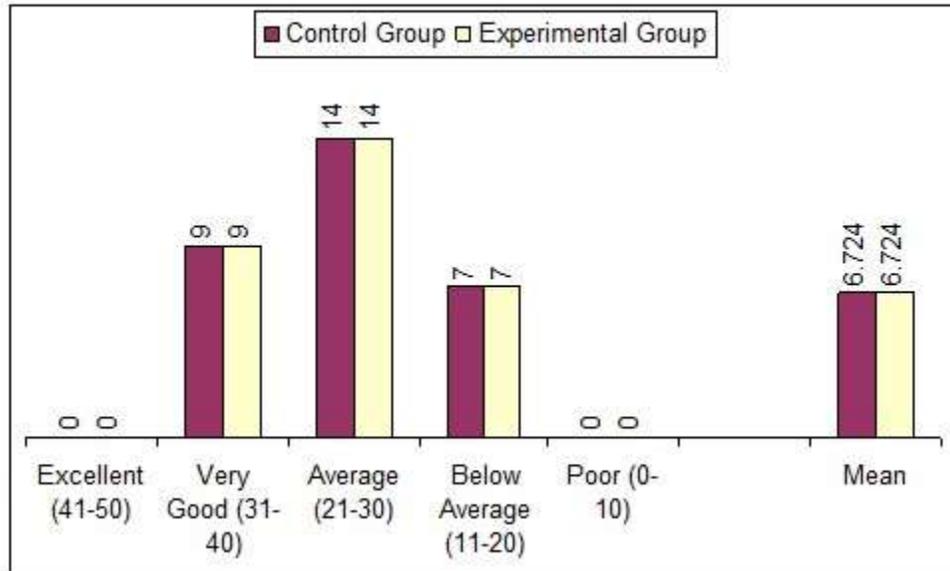


Figure 1. Pre-test Scores of the Respondents

In the posttest results, the control group attained a mean of 38.83 and obtained a standard deviation of 5.796. On the other hand, the experimental group received a mean of 43.97 and obtained a standard deviation of 3.97.

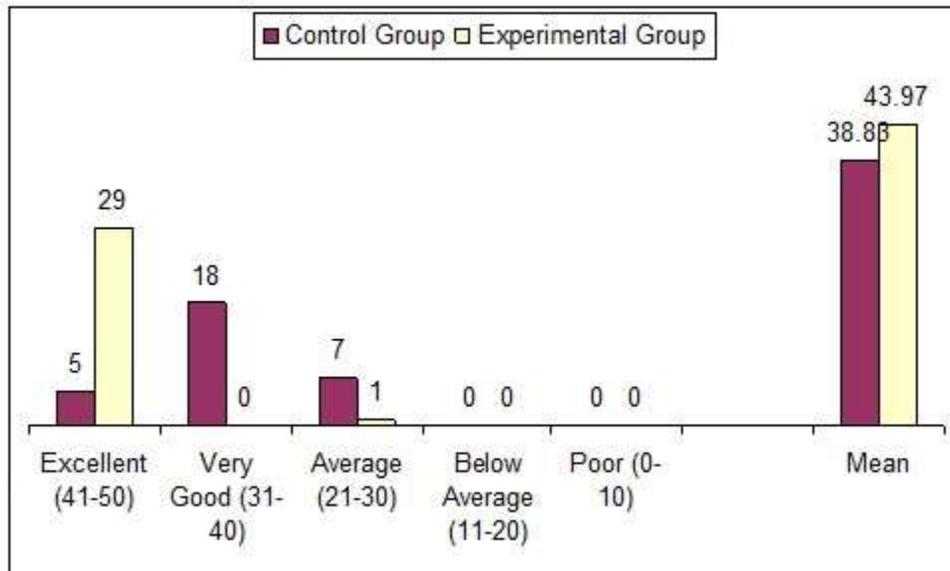


Figure 2. Posttest Scores of the Control and Experimental Group

Pertaining to the incremental performance, the control group achieved a total score of 277, received a mean of 9.23 and obtained a standard deviation of 5.341. On the other hand, the experimental group attained a total score of 551, acquired a mean of 18.37 and achieved a standard deviation of 4.76. There is a higher increase of scores from pretest to posttest in each respondent.

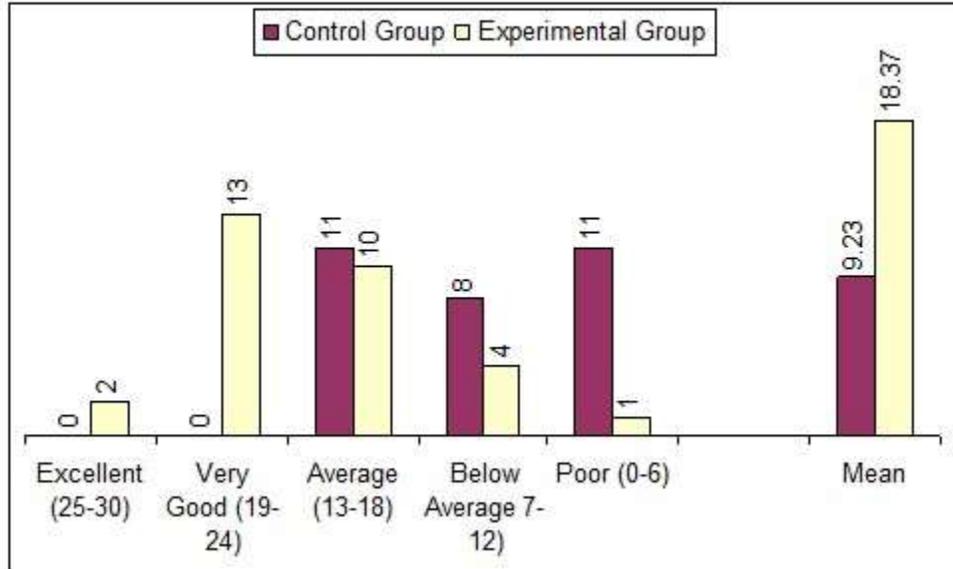


Figure 3. Incremental Scores of the Respondents

As regard to quiz performance, the control group achieved a total score of 766, received a mean of 25.53 and obtained a standard deviation of 7.59 . On the other hand, the experimental group attained a total score of 1,142, acquired a mean of 38.07 and achieved a standard deviation of 3.9.

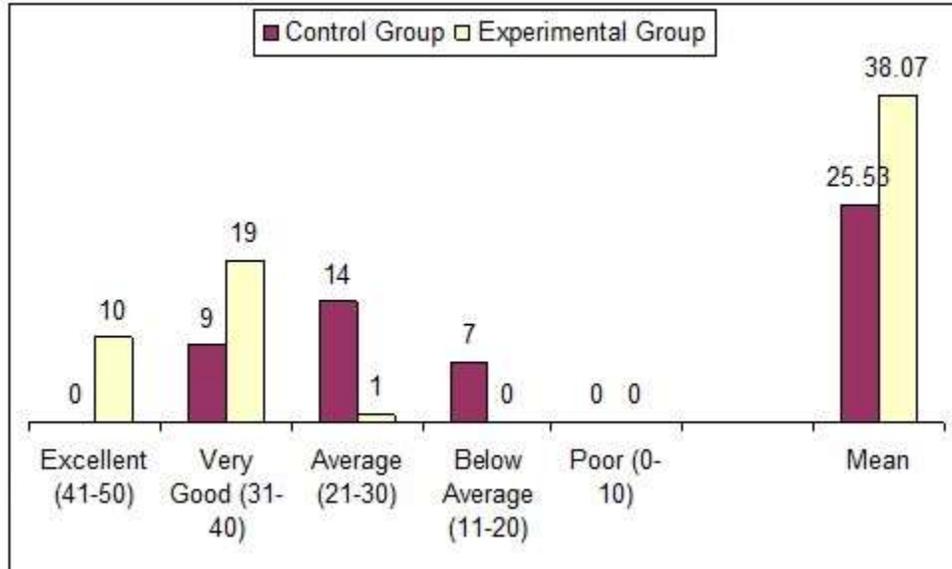


Figure 4. Quiz Performance of the Respondents

On the significant difference between the pretest and posttest within the experimental group, the pretest had a mean of 25.6 and a standard deviation (SD) of 6.724 while the posttest had a mean of 43.97 and a standard deviation (SD) of 3.97. Upon computation of the *t*-test at 0.05 alpha level of significance and a degree of freedom of 58, the computed *t*-value arrived at 12.85 which is greater than the tabled value of 1.671. This means that the null hypothesis is rejected and concluded that there is a significant difference between the pretest and posttest within the experimental group.

On the significant difference between the control and the experimental group in terms of posttest level of performance, the experimental group had a mean of 43.97 and a standard deviation (SD) of 3.97 while the control group had a mean of 34.83 and a standard deviation (SD) of 5.796. Upon computation of the *t*-test at 0.05 alpha level of significance and a degree of freedom of 58, the computed *t*-value arrived at 7.14 which is greater than the tabled value of 1.671. This means that the null hypothesis is rejected and concluded that there is a significant difference between the control group and experimental group in the posttest level of performance.

On the significant difference between the control and the experimental group in the incremental level of performance, the experimental group had a mean of 18.377 and a standard deviation (SD) of 4.76 while the control group had a mean of 9.23 and a standard deviation (SD) of 5.341. Upon computation of the *t*-test at 0.05 alpha level of significance and a degree of freedom of 58, the computed *t*-value arrived at 6.98 which is greater than the tabled value of 1.671. This means that the null hypothesis is rejected and concluded that there is a significant difference between the control group and experimental group in the incremental level of performance.

On the significant difference between the control and the experimental group in the algebraic expression performance, the experimental group had a mean of 38.07 and a standard deviation (SD) of 3.9 while the control group had a mean of 25.53 and a standard deviation (SD) of 7.59. Upon computation of the *T*-test at 0.05 alpha level of significance and a degree of freedom of 58, the computed *t*-value arrived at 8.03 which is greater than the tabled value of 1.671. This means that the null hypothesis is rejected and concluded that there was a significant difference between the control group and experimental group in the quiz performance.

DISCUSSION

The process of employing write-pair-share approach in teaching algebraic expressions was described by explaining the purpose of the activity to the class, providing a statement of or question about the idea to be discussed and explaining the “rules” for discussion. Then guide the process by giving the instructor’s prompt, student with their pair, take a few moments to write a response. Pair up to talk about each of their answers. They compare their mental or written notes and identify the answers they think are best, most convincing, or most unique. Following the pair discussions, the instructor spends a few moments asking pairs to share their thinking with the rest of the class. This may be done by calling on pairs randomly or in round-robin fashion or accepting volunteers (answers are called out or by raised hands).

Based on the results of the study, almost all of the students or 99% in the experimental group during posttest fell under the excellent category while majority of the students in control group belonged to very good category. This implies that there is a big difference in the students’ level of performance between experimental and the control groups. This further indicated that the teaching approach used in these two groups gave different results. This implies that the write-pair share approach, which was used as the teaching strategy in experimental group, brought the higher increase of performance of the students in the said group. On the other hand, the traditional approach, which was used as the teaching strategy in control group, did not produce the desired level of performance. These results indicate that write-pair share approach is indeed an effective strategy in the teaching of Mathematics.

On the relationship of variables, the experimental group which was exposed to write-pair-share approach as its teaching methodology showed a higher increase of performance in the posttest results than the performance of the control group. These suggested that the strategy employed in the experimental group was effective and useful in the conduct of the Mathematics instruction. The students exposed to this kind of teaching strategy showed an increase of performance because the method given to them was really a good idea of interaction of students between their pairs. The interaction provided them enough experience to be able to get through the mathematical problems and equations easier and faster than that of the control group whose students were left with traditional method.

The data provided that there was an excellent performance in the experimental group that were exposed to the write-pair-share approach as the teaching methodology compared to that of the control group that were exposed to the traditional approach. These results imply that the higher quiz result of the experimental group was brought about by the strategies and methods employed using write-pair share approach in the class. On the other hand, the low performance of the control group that was exposed to traditional approach showed that the teaching method employed

was not more effective and did not produce a desired level of performance. Therefore, the results of the quizzes in the control group indicated that there is still another teaching approach that will give effective outcomes in the Mathematics class. The big difference between the standard deviations and the means of the two groups indicated that the write-pair share approach is indeed an effective strategy in the teaching of Mathematics.

CONCLUSION

Since the process of employing write-pair-share approach in teaching algebraic expressions in experimental group gave a better performance of the students, this concluded that write-pair-share teaching approach was indeed an effective strategy in teaching Mathematics.

The difference in the algebraic expression performance and post-test between the control and experimental groups suggested that the two strategies employed in the said groups also differed. The higher increase of the performance of the experimental group compared to the control group concluded that write-pair-share teaching approach employed as a teaching strategy in the said group is more effective than the traditional approach used in the control group.

Write-pair-share teaching approach employed in the experimental group is indeed an effective strategy and can develop a stronger foundation in acquiring concepts and skills in Mathematics subject because this will allow the students to interact among their pairs.

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