



COOPERATIVE LEARNING: ITS EFFICACY IN IMPROVING TECHNOLOGY AND LIVELIHOOD EDUCATION PERFORMANCE

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ABSTRACT

This study investigated the efficacy of an 8-week cooperative learning strategy as an intervention to improve the performance of technology and livelihood education among the Grade 7 students at Sagayen National High School. To gather data, a quantitative research design, specifically an experimental design, was employed. The results of the experiment indicated a positive result in the performance of the subjects after they participated in the intervention. These findings suggested that implementing a cooperative learning strategy could be an effective strategy to provide additional support and address the learning deficiencies of students. Moreover, this study contributed valuable insights to the field of education by expanding the knowledge base through an exploration of cooperative learning strategies and their potential to enhance student achievement.

KEYWORDS: cooperative learning, student performance, experimental research design, quantitative research, Philippines

INTRODUCTION

The ability to foster collaboration and communicative skills was the essence of cooperative learning. Students gained knowledge on how to listen to others, shared their ideas effectively, and worked as a team to develop answers and accomplish a common objective. Cooperative learning was very important in real-life situations not only in classroom settings.

Cooperative learning in Technology and Livelihood Education (TLE) could comprehensively allow students to gain professional experience while learning. Information, media, and technological abilities, analytical and creative skills, efficient communication skills, and life and job skills would all be imparted to each graduate. The new broadened curriculum's objectives were mostly attained with the help of subjects in livelihood education and technology (Pura & Galicia, 2022).

According to the 2018 Philippine Educational Measurement and Evaluation (PEME) report, only 60% of Grade 7 students met the minimum proficiency level in TLE. This suggested that more research was necessary to determine whether TLE programs are beneficial in raising students' levels of knowledge and skill. Despite the significance of TLE in the K-12 curriculum, there was a lack of research on how well it works to improve the knowledge and skills of learners. According to a research by Barcelona et al. (2023), TLE teachers dealt with a number of difficulties, including few resources, insufficient training, and inadequate time spent preparing for their lessons. These challenges hindered their ability to deliver effective instruction and limited students' learning opportunities.

In our school at Sagayen National High School, the TLE 7, 8, 9, and 10 teachers found out that after the pandemic and during the beginning of the in-person classes, the learners Diagnostic Test in TLE specifically in TLE 7 revealed that the performance is very alarming as they only obtain an average of 41% mean percentage score in their Diagnostic Test. In addressing this problematic condition, I look for possible solutions/interventions that could help in improving the learner's academic performance. Students enrolled in the 7th grade Technology and Livelihood Education (TLE) are often unable to fully understand the technical and entrepreneurial concepts. As a result, their performance is poor in this subject, which prevents them from developing the necessary skills for their future careers.

Thus, the purpose of this study was to determine if cooperative learning improves the academic performance of TLE students in the seventh grade. Pre- and post-tests would be used in the study's quantitative methodology to measure



the learning progress of each student. Therefore, this study would benefit the students in the aspect of they could use their knowledge in choosing their future career and these would also help other educational sector of how TLE might likely be implemented in schools.

Statement of the Problem

The purpose of the study was to determine whether cooperative learning at Sagayan National High School in Sagayan, Asuncion, Davao del Norte, might improve the performance of students studying technology and livelihood education. In particular, the research sought to respond to the following questions:

1. What is the level of performance of the Grade 7 TLE students in both the control and experimental groups as reflected in their pretests?
2. What is the level of performance of the Grade 7 TLE students in both the control and experimental groups as reflected in their posttests?
3. Is there a significant difference in the performance of the Grade 7 TLE students before and after the intervention as reflected in the pretests and posttests?

1.2 Review Related Literature

Interaction with Highly-Proficient Teachers

Cooperative learning is a kind of learning or classroom practice which has been utilized for a very long time ago, and a number of academic researches show that its effectiveness to increase students' performance. Collective work based on team spirit was a principle surrounding their educational process. They could only be successful in meeting the targets if they worked cooperative. He has revealed that several facts like learning is more productive with cooperative learning it later leads to knowledge acquisition, creative performance, heightened motivation, and improved social skills. Cooperative learning, which built up interest among researchers in the educational field over the last few decades, from which came a fruitful work that led in the development of this strategy, is already a well-known outcome of this work. The main destiny of classrooms is to stress teamwork and mutual help, as well as make students learn how to help each other in achieving the class goals. Being a base of collaborative learning, teamwork was a guiding principle among students as their performance was towards a definite objective. The students collaborate through group activities like carrying a task together, exchanging ideas in the discussion section, passing knowledge and skills from one person to another, and communicating in a working session, as they make concerted efforts to arrive at a single conclusion instead of competing against one another.

Aydemir and Karali (2018) indicated that building up a cooperative learning opportunity specifically during math classes for students would suggest such a solution was the remedy for the problem as it would improve the students' mathematical performance. Students with different learning styles, mixing passively into problem-solving, and a huge shift from a group-think to an individualistic style are all considerably supported by the cooperative learning model. The study also emphasized how critical it is to make the proper decisions and apply cooperative methods and strategies at the appropriate development and age range, rather than questioning their contribution to success or attitude he efficacy of cooperative learning had been demonstrated through many studies in the field of education indicating that students who engaged in cooperative learning activities accomplished well than those who did not.

Although research has demonstrated that cooperative learning can help students successfully on many instances, yet other studies have doubted its effectiveness in certain settings. For instance, Kirschner, Sweller and Clark (2006) in their study dispel the notion that collaboration is the most effective strategy for the learner's performance. The researches note that co-operative learning is not as effective as the conventional teaching methods in certain conditions. Firstly, this approach points out that cooperative learning may be less successful with complex tasks that require a high level of thinking process. The researchers, in this light, suggest that the individual learning may be more successful, the point being that students can attend to their own learning necessities and mental processes. The study, furthermore, showed that when group members have different sets of skills or knowledge level, learning collectively may be not be that effective. In such circumstances, there is a possibility that students could become dependent on the other people to perform the tasks while some others might feel frustrated and ceased to participate if they fail to contribute to the groups overall success.

Although cooperative learning has several pros for students, it is not always the best way to lift up students' grades. There are some occasions when individual learning produces better results, and cooperative learning may fall short in situations where group members have different levels of competence or skills, or when the structure is not well formed and supported. Despite the success of cooperative learning in diverse studies to improve student performance, the literature lacks an all-inclusive approach that can be implemented in real-world teaching and learning scenarios. One of the findings from a study done by Johnson, Johnson and Smith (2015) indicates that cooperative learning's effectiveness often depended on the students knowing and assuming their roles in the group.

1.3 Theoretical Framework

The present research is based on the social interdependence theory which was introduced by Kurt Lewin (2012) who argued that the behavior and outcomes of individuals were dependent on each other in the group or social systems. The philanthropic learning method, cooperative learning, which envisages a student group work directed to a single goal, is gaining more and more popularity. According to Johnson and Johnson, this method has been proven to be most effective in terms of boosting student accomplishment not only in academics but also in other areas. The social interdependence theory is one notion that has been advanced to provide the background of why cooperative learning works.

The study's conceptual framework covered both dependent and independent variables. The purpose of the study was to determine whether cooperative learning at Sagayan National High School in Sagayan, Asuncion, Davao del Norte, might improve the performance of students studying technology and livelihood education.

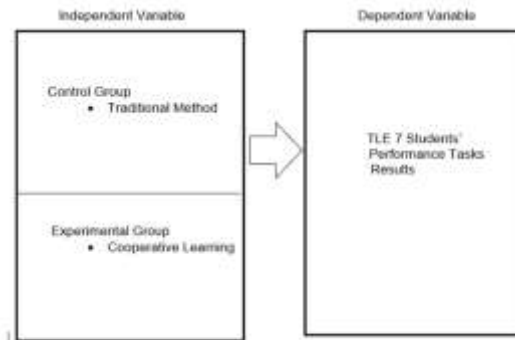


Figure 1: Conceptual Framework

2. METHODOLOGY

2.1 Research Design

The study used an experimental research design and a quantitative research methodology. A scientific approach to doing experimental research using two sets of variables was achieved via the use of experimental research design, which was an organizational structure of protocols and procedures. In this case, the first collection of variables served as a constant and is employed to calculate the second set's differences (Patten, 2016). The design was suitable for the study because the subjects are gathered naturally, much like in a classroom setting. This design would be used to examine if there will be a significant difference in the use of cooperative learning and the traditional method in teaching Grade 7 students at Sagayan National High School.

2.2 Research Locale

The focus of this study was to investigate the academic performance of students at Sagayan National High School, a public educational institution located in Purok 2, Sagayan, Asuncion, Davao del Norte Division. The school is led by a principal III and has 65 teaching personnel. Sagayan National High School is a public educational institution located in Purok 2, Sagayan, Asuncion, Davao del Norte Division, Philippines. By the school year 2022–2023, the school has about 1,200 students enrolled in grades 7–12.

2.3 Research Subjects

The subjects of this research were the grade 7 students of Sagayan National High School for the school year 2022–2023 who will be subjected to the pre-test and post-test. The data gathered from the score of the pre-test of the grade 7 students of Sagayan National High School for the school year 2022–2023 and scores from the post-test of the Technology and Livelihood Education, those students were taken as the subjects of the study with 30 subjects for the control group and 30 students for the experimental group with a total population of 60 students.

2.4. Research Instruments

For this study, a parallel teacher-made tests were used. It made up the pretest and posttest. These tests were prepared and constructed by the researcher after a thorough review of topics and other units of Technology and Livelihood Education in Grade 7 modules that were already proofread and validated by the Department of Education. A table of Specification (TOS) was prepared for every lesson to accumulate the various test questions suitable for the questionnaire. The results of the tests were used for statistical treatment of data to show that the utilization of the Cooperative Learning Approach had an effect to the TLE performance of the Grade 7 students.

2.5 Statistical Treatment

This study utilized statistical tools such as mean, and T-test. This was utilized to show the significant difference in the effectiveness between the cooperative learning approach and the traditional way of teaching TLE.



3. RESULTS AND DISCUSSION

This chapter presented the data collected and organized in the conduct of the study. It included the presentation, analysis, and interpretation of the data. The presentation of the data and the analysis were organized according to the statement of the problem.

Level of Performance of Grade 7 TLE Students in the Pretests Table 1 shows the level of performance of Grade 7 TLE students as reflected in their pretest scores.

Table 1
Pretest Level of Performance of Grade 7 TLE Students

Group	N	MEAN	Standard Deviation	Description/Interpretation
Control Group	30	21.47	5.49	Did not Meet Expectations
Experimental Group	30	23.07	5.39	Did not Meet Expectations
Average Level		22.27	5.44	Did not Meet Expectations

The result implied the mean of the Control Group and the Experimental Group of 21.47 and 23.07, respectively, indicating the average performance level of Grade 7 learners in Technology and Livelihood Education during the Pretest. In this context, it suggests that, on average, the learners' scores 'Did not Meet Expectations' as their class proficiency falls below 75%. The standard deviation of 5.44 indicates that the individual performance scores of Grade 7 learners during the assessment have relatively low variability. A lower standard deviation suggests that most students' scores are close to the mean.

The average level mean shows that a substantial portion of the students might be struggling with their TLE Performance

These results implied that the mean score being below what might be expected for Grade 7 students indicates that there is a need for improvement in Technology and Livelihood Education performances. This could be due to various factors, such as teaching methods, individual learning differences, or the complexity of the assessment. The Grade 7 students' performance varies widely, as seen by the comparatively high standard deviation. Some students may have performed much better than the mean, while others may have scored significantly lower. It would be essential to further investigate the reasons for this variation.

Further, to address the 'Did not Meet Expectations' and Technology and Livelihood Education performances, it may be necessary to consider targeted interventions and teaching strategies. Additional assessments, diagnostic tools, and feedback mechanisms can help identify areas of weakness and provide personalized support to struggling students.

Level of Performance of Grade 7 TLE Students in the Posttests

Table 2 showed the level of performance of Grade 7 TLE students as reflected in their posttest scores.

Table 2
Posttest Level of Performance of Grade 7 TLE Students

Group		Average	Standard Deviation	Description/Interpretation
Control Group	0	43.97	3.995	Very Satisfactory
Experimental Group	0	50.47	6.404	Outstanding
Average Level		47.22	5.199	Very Satisfactory

The control group earned mean score of 43.97, while experimental group of earned mean score of 50.47 revealed a description of very satisfactory in the performance level of Grade 7 students in Technology and Livelihood Education performances in the posttest. The standard deviation of 5.199 indicates that the individual performance scores of Grades 7 students in the Technology and Livelihood Education performance during the assessment have relatively low variability. A lower standard deviation suggested that most students' scores were close to the mean. The label "Very Satisfactory" implied that the average score of 47.22 is in the range that is considered appropriate for Grade 7 students. It suggested that students are performing at a level that is suitable for their grade and indicates a good subject performance.



Furthermore, the mean score being substantially higher than what might be expected for Grade 7 students is a positive sign. It suggested that, on average, these learners have a strong grasp of TLE performance after classroom instruction. The individual performance scores were closely concentrated around the mean, as indicated by the low standard deviation. This suggested that most students are performing at a similar, high level, and there is less variability in their performance. Achieving a “Very Satisfactory” after the post-test indicated that the instruction or teaching methods employed have been effective in helping students acquire skills involved in their TLE performance.

Significant Difference in the TLE Performance Between the Control Group and the Experimental Group in the Pretest

Following a descriptive analysis of the collected data, a Paired Sample T-test was used to measure how well students were progressing with their TLE performance following the pre-test. Table 3 displays an overview of the Paired Sample T-Test results.

Table 3
Comparative Results of the Levels of Performance of Grade 7 TLE Students in the Pretests

Pretest Scores	N	Ave.	SD	Df	t	P	pt	Finding	Conclusion
Control Group	30	21.47	5.49	29	-1.076	0.291	0.05	Accept Ho	No significant difference
Experimental Group	30	23.07	5.39						

The table showed that a negative t-value indicates that the mean of the pretest scores is lower than the mean. A measure of the mean difference between the experimental and control groups was the t-statistic. The pre-test results indicate that there was no significant difference, as indicated by the t-value of -1.076.

In addition, 29 degrees of freedom denoted the total number of variables that might change in a statistic's final computation. Based on the sample sizes of the experimental and control groups, the degrees of freedom were computed. According to the degrees of freedom, a sample size of 29 individuals was used for the analysis. It's important to consider the sample size when interpreting the results, as larger samples could lead to more reliable findings.

A p-value of less than 0.291 suggests that there is very low probability that the variation in TLE performance between the two separate assessments is the result of chance. In real terms, this indicates that there is substantial evidence to support the conclusion that there is no statistically significant difference. Moreover, the null hypothesis—that there is no significant difference between the control and experimental groups during the Pretest—is strongly supported by statistical evidence when the p-value is less than 0.001.

Instead, it is reasonable to conclude that there is still no intervention implemented that is why the result is to accept the null hypothesis which is there is no intervention implemented that improve learners’ performance.

Significant Difference in the TLE Performance Between Control Group and Experimental Group in the Pretest and Posttest

Following a descriptive analysis of the collected data, a Paired Sample T-test was used to measure how well the students' TLE performance had improved following the intervention. It was employed to determine whether or not cooperative learning might improve students' TLE performance. Table 4 displays an overview of the Paired Sample T-Test results.

Table 4
Comparative Results of the Levels of Performance of Grade 7 TLE Students in the Pretests

Posttest Scores	N	Ave.	SD	Df	t	P	pt	Finding	Conclusion
Control Group	30	43.97	3.99	29	4.890	.000	.05	Reject Ho	Significant difference
Experimental Group	30	50.47	6.40						

A comparison of the posttest mean scores was shown in the table, and at the 0.05 level of significance, the calculated t-value of -4.890 is bigger than the tabular t-value of 2.045. As a result, the posttest results showed a significant difference in the mean scores between the control and experimental groups, rejecting the null hypothesis. It means that the two groups after the intervention significantly differ. Both groups improved at the end of the duration of learning sessions but when compared, the experimental group fared better. The post-test outcomes showed that the grade 7 students' TLE Performance improved when they used cooperative learning. The study's findings indicate that cooperative learning has a big impact on students' comprehension of TLE concepts as well as skills.



FINDINGS, CONCLUSION AND RECOMMENDATION

Findings

This chapter presented the summary of findings, conclusions and recommendations of the research study. With the problems and the data gathered as well as the consequent analyses using appropriate statistical tools, the following findings were gathered.

1. The mean score of the students in the control group in the pretest was 21.47% interpreted as Did Not Meet Expectation.
2. The mean scores of the students in the experimental group in the pretest was 23.07% interpreted as Did Not Meet Expectation.
3. The mean score of the students in the control group in the post-test was 43.97% interpreted as Very Satisfactory.
4. The mean score of the students in the experimental group in the pretest was 50.47% interpreted as Outstanding.
5. There was a significant difference in the mean scores between the control group and the experimental group after the utilization of Cooperative Learning.
6. These results emphasized the importance of cooperative learning in students' skill development and implied that social learning has a favorable impact on seventh-grade students' TLE performance. The actions and results of one person are contingent upon those of other people in the same group or social structure.

Conclusions

A few interpretations might be made by the research's findings. Grade 7 students' TLE Performance improved significantly as a result of cooperative learning. With an increase of 81.78% from the pretest, the Grade 7 students' TLE performance before and after the test differed considerably.

Recommendations

Based on the results and conclusions made throughout the investigation, the following recommendations are drawn from the study "Cooperative Learning: Its Efficacy In Improving Technology And Livelihood Education Performance":

1. It is suggest to incorporate Cooperative Learning into educational settings, especially in teaching Technology and Livelihood Education. These programs can be structured to provide students with opportunities to engage in collaborative activities, receive feedback from peers, and enhance their technical skills.
2. It is better to use Cooperative Learning in teaching struggling students so that student's involvement will increase, and it will give better result on students' performance.
3. It is expected that teachers encourage collaborative activities and discussions during Cooperative Learning. This can be achieved by incorporating interactive tasks, such as shared learning, partner learning, or group discussions. Developing such platforms where students can interact with each other about learning tasks that boosts their academic performance and enhances learners comprehension of the topic. Therefore, the aim of cooperative learning can be achieved.
4. It is an interesting and useful experience to monitor and assess progress: Periodical evaluation of students' performance must be done for the purpose of measuring the efficacy of cooperative learning activities. Use formative assessments to track students' performance cumulatively and spot places that need more help. By doing so, teachers can easily adapt their teaching methods and implement targeted interventions if necessary.
5. The objective is to devise a cooperative learning activity that is supportive and conducive to learning. This study will also help future researchers to support or reject the outcomes of this study.

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