INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH
2023, Vol. 4, No. 7, 2592 – 2600
http://dx.doi.org/10.11594/ijmaber.04.07.35

Research Article

The Collaborative-Individual Learning in Improving the Critical Thinking Skills of Secondary Students in the Philippines

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Article history:
Submission July 2023
Revised July 2023
Accepted July 2023

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ABSTRACT

Critical thinking is at the forefront of learning, it builds self-empowerment and confidence. The study aimed to evaluate the influence of collaborative-individual learning on the critical thinking abilities of secondary students in the Philippines. The research sought to answer several questions, including the initial level of critical thinking skills, how the collaborative-individual learning approach was implemented, the level of critical thinking skills after the intervention, whether there was a significant difference before and after the intervention, and which group of students benefited the most from the approach. The study involved 215 Grade 10 students and utilized a single subject experimental design. Pretests and post-tests were conducted, and statistical tools such as item analysis, frequency distribution, mean difference, standard deviation, and t-tests were employed. The findings indicated that the students' critical thinking skills improved significantly after the application of collaborative-individual learning. School C demonstrated the highest level of interest and implementation. Based on the results, the study recommends incorporating collaborative-individual learning in teaching Economics and other subjects to enhance students' critical thinking skills. School administrators are encouraged to promote the use of this strategy.

Keywords: *Collaborative individual learning critical thinking Economics Zone IV*

Introduction

Critical thinking is crucial for functioning effectively in the rapidly evolving world of the 21st century. Consequently, it is essential to prioritize conscious learning and actively engage in teaching methods that foster critical thinking skills. Unfortunately, schools often fail to emphasize the fundamental intellectual standards necessary for developing critical thinking abilities. As a result, many young individuals frequently exhibit deficiencies in reasoning and problem-solving capabilities. This is a big challenge to teachers who are on the

How to cite:
Viado, A. L. & Department, J. A. E. (2023). The Collaborative-Individual Learning in Improving the Critical Thinking Skills of Secondary Students in the Philippines. *International Journal of Multidisciplinary: Applied Business and Education Research*. *4*(7), 2592 – 2600. doi: 10.11594/ijmaber.04.07.35

forefront of preparing young people for the unique demands of a 21st century world.

Willingham (2007) believes that teaching critical thinking skills is very tough, and only confuses students. He asserts that having knowledge about the pertinent content and engaging in thoughtful reflection are two essential factors that enable critical thinking. Critical thinking as an essential skill required in the workplace, and be used to evaluate people, policies, and institutions to avoid social problems (Hatcher & Spencer, 2005).

A critical thinker is an individual who tries to solve complicated problems in different ways by asking questions, gathering relevant information, determining findings, and practically communicating those (Paul & Elder, 2008). It is expected critical thinkers to apply their great thinking skills in order to overcome various domains, including school, work, and home (Butler, 2012).

One of the innovative teaching strategies is the collaborative technique which is based on the well-tested cooperative learning concept. The concept of collaborative learning, which involves grouping and pairing students to achieve academic objectives, has garnered extensive research and support in professional literature. Collaborative learning refers to an instructional approach where students of different proficiency levels collaborate in small groups to accomplish a shared goal. In this method, students are accountable for both their individual learning and the learning of their peers. Consequently, the achievements of one student contribute to the success of others in the group.

Individual learning is an instructional approach where students independently work at their own level and pace to achieve academic objectives. It allows students to progress at their own speed and necessitates time management skills. If needed, teachers should dedicate time to teach study skills and always provide structure for individual learning. In order for collaborative-individual learning to be successful, teachers must perceive teaching as a process of nurturing and enhancing students' learning abilities. The role of the teacher is not merely to transmit information, but to act as a facilitator for learning. This entails creating and managing meaningful learning experiences and stimulating students' thinking through real-world problems. Hence, the researcher will try to gauge the effectiveness of collaborative-individual learning in improving the critical thinking skills of the Grade 10 students in Economics.

Swain (1997) describes Collaborative Learning (CL) as one of the most important and most effective means by which learning can take place, and a focus on the mutual exploration of subject by means of social interaction with peers and between learners and teachers has experienced a long history. Dillenbourg (1999, p. 1) gives a global definition to CL as a "situation in which two or more people learn or attempt to learn something together." In this definition, the phrase "two or more people" can be interpreted to encompass a range of scenarios, including a pair, a small group consisting of three to five learners, a class with 20-30 students, a community with several hundred or thousand individuals, or a society comprising several thousand or millions of people. The term "learn" denotes engagement with a course, studying teaching materials, participating in learning activities, or the accumulation of lifelong work experience. The word "together" encompasses various forms of social interaction, such as face-to-face interaction or interaction facilitated by computers. It encompasses collaborative efforts regardless of whether they are truly collective achievements, as well as the presence of systematic organization in the work.

Participating in Collaborative Learning (CL) makes students more critical in their thinking (Gokhale, 1995). Maesin et al. (2009) argue that the likelihood of critical thinking is dictated by the learning environment and the teaching approach used. In Gokhale's (1995) investigation of the effectiveness of individual versus collaborative learning in enhancing drill-practice skills and critical-thinking skills, the results reveal that students engaging in CL performed significantly better compared with those who studied individually. This is because CL encourages critical thinking through the problem-solving process (Johnston et al. 2000).

Thinking encompasses various functions, including reasoning, concept formation, critical

and creative analysis, decision-making, and problem-solving. In the present era, humanity faces an overwhelming influx of information, coupled with a rapid expansion of experiences and knowledge. Given the abundance of diverse information sources, selecting appropriate materials becomes a challenging task. It necessitates the utilization of high-level intellectual and rational skills such as reflection, argumentation, comprehension, and evaluation, all of which are integral aspects of critical thinking. It is crucial for individuals to develop and cultivate critical thinking abilities. According to Dam and Volman (2004), citizenship in the modern world requires qualifications beyond the traditional definitions and essence, reflecting the changing nature of our society.

As the critical thinking is a complex concept and has convoluted conceptual activity and process, it is not straight forward to describe and evaluate that (Wilgis & McConnell, 2008).

VanGelder (2005) argues that "deliberate practice" in exercising critical thinking skills and abilities is necessary to students. Critical thinking empowers individuals with cognitive skills, a propensity for asking probing questions, and a natural inclination for deep thinking. An individual requires the experience and thoughtful survey in order to employ attained knowledge in real environments; hence, there is a relation between the level of one's ability in critical thinking and presenting his professional role (Keating, 2006). There are various methods that can impact the teaching of critical thinking skills to learners. The utilization of active methods plays a significant role in enhancing the depth of learners' education. Willis (2009) believes that cooperative learning activities are helpful to succeed when the tasks assigned to students truly require them to work together to meet the objective.

Statement of the Problem

The research questions in this study are:

1. What is the baseline level of critical thinking skills among Grade 10 students prior to implementing the intervention?
2. How was collaborative-individual learning applied to enhance the critical thinking skills of Grade 10 students?
3. What is the post-intervention level of critical thinking skills among Grade 10 students?
4. Is there a statistically significant difference in the critical thinking skills of students before and after the intervention was implemented?
5. Which group of students attained the greatest learning as regards to application of the intervention procedure used?

Hypotheses

1. There is no statistically significant difference in the level of critical thinking among students before and after implementing the collaborative-individual learning strategy.
2. There is no statistically significant difference in the change of critical thinking skills resulting from the use of different teaching procedures.

Methods

Research Design

The study employed a "single subject experimental design" to assess the effectiveness of collaborative-individual learning in teaching Economics. The respondents were assigned to both the control and experimental groups, undergoing a pre-test before the treatment was introduced, followed by a post-test afterward. This design facilitated the assessment of the treatment's impact by comparing the disparities between the pre-test and post-test results.

Respondents and Location

The researcher selected two sections of Grade 10 students from three national high schools in Zone IV. School A in Subic had 73 respondents, School B in Castillejos had 74 respondents and there were 68 respondents in School C in San Marcelino, Zambales. There were a total of 215 respondents in the study.

Figure 1. Map of Zone IV

Instruments

To evaluate the effectiveness of collaborative-individual learning in Economics for Grade 10 students, a pre-test and post-test were conducted. Rubrics were used to assess students' performance, participation, interaction, and activities in collaborative-individual learning. Summative tests were given after each lesson to measure the impact of this learning strategy on critical thinking skills. The researcher analyzed the pre-test scores, conducted observations, and administered the post-test at the end of the third grading period. The tests consisted of 50 items covering topics from the Third Quarter, focusing on analysis, synthesis, and evaluation. Item analysis was performed to refine the test, and multiple-choice questions were used to gauge critical thinking skills. Students were encouraged to carefully read and analyze the questions and choices for accurate responses.

Data Gathering Procedure

A pre-test/post-test assessment was conducted to evaluate the proficiency of critical thinking skills among Grade 10 students. The study described collaborative-individual learning, focusing on four key elements: motivation, lesson presentation and activities, generalization, and evaluation. Motivation involved arousing students' interests before starting the lesson, while lesson presentation encompassed various techniques such as lectures, activities, and output presentations. Generalization involved clarifying and unifying concepts after student presentations, emphasizing participation. Evaluation utilized rubrics and tests for formative assessment. Qualitative data, including observation and documentation, were also used to evaluate the application of collaborative-individual learning in enhancing students' critical thinking skills in selected schools.

Data Analysis

The study conducted an analysis to assess the impact of the collaborative-individual learning strategy before and after its application. Several statistical tools were employed, including item analysis to identify the most and least learned items in the pre-test/post-test. Frequency and percentage distribution were employed to analyze the distribution of students' scores. The mean was calculated to determine the average score and evaluate the level of critical thinking skills using a qualitative interpretation scale. Standard deviation

was utilized to assess the homogeneity or heterogeneity of students' critical thinking abilities. The mean difference was utilized to identify the group or school with the greatest learning improvement. A t-test was conducted to determine if there was a significant difference between the pre-test and post-test, indicating an enhancement in critical thinking skills through collaborative-individual learning.

Results and Discussion

Level of Critical Thinking Skill before the Application of Collaborative-Individual Learning

Table 1 shows the mean scores and variability of the students in each Grade 10 section in the three schools of Zone IV, Division of Zambales during the pretest.

Table 1. Mean Scores of Students on the Pretest

School	Section	N	St. Dev.	Mean	Qualitative Interpretation
A	Aristotle	33	4.267	20.68	Good
	Soren	40	3.451	18.24	Fair
B	Zircon	36	3.986	25.64	Good
	Diamond	38	3.156	20.56	Good
C	Garcia	34	3.438	21.62	Good
	Quezon	34	4.601	19.43	Fair
Overall Mean				**21.03**	**Good**

Scale: 0-10 Poor, 11-20 Fair, 21-30 Good, 31-40 Very Good, 41-50 Excellent

The researcher conducted a diagnostic pretest to assess the level of critical thinking skills among students in the three schools within Zone IV Division of Zambales.

Data revealed that in School A, Section Aristotle garnered a mean of 20.68 (**Good**) with a standard deviation of 4.267. Section Soren had a lower mean of 18.24 (**Fair**) with SD=3.451. In School B, Section Zircon garnered a mean of 25.64 (**Good**) and SD=3.986 while Section Diamond had a lower mean of 20.56 (**Good**). In School C, Section Garcia garnered a mean score 21.62 (**Good**) with SD=3.438 while Section Quezon had a lower mean score 19.43 (**Fair**). It can be summarized from the data that the critical thinking skills of the Grade 10 students in Zone 4 before the application of collaborative-individual learning strategy were at "**Good**" level (21.03).

Application of the Collaborative-Individual Learning Strategy

Collaborative-individual learning proceeded with four (4) elements- motivation, lesson presentation and activities, generalization and evaluation.

Motivation is the arousal of the interests of the students before proceeding to the lesson for the day.

Lesson presentation consisted of the techniques used by teacher to introduce and teach the lessons. This included lectures, class activities and output presentations.

Generalization is the recapitulation conducted after the presentation of student outputs to clarify and unify the concepts drawn by the students during class activity. Student participation was encouraged.

Evaluation is the formative assessment of student performance using rubrics and tests.

- Rubrics. The researcher devised a rubric in scoring the performance of the students.
- Test. Formative and summative assessments were conducted to evaluate the progress of students' critical thinking skills.

Table 2. Collaborative-Individual Learning Activities

Topic	Type of Learning	Activity/ InstructionalMaterials	Expected Outputs	Evaluation
Aralin 1 Paikot na Daloy ng Ekonomiya	Collaborative	Collage Construction • Recyclable materials • Glue/paste • Pair of scissors	Collage constructed by group	Rubrics in Collage Making and Collaborative Learning
Aralin 2 Pambansang Kita	Individual	Venn Diagram Completion • Manila paper • pentouch	Complete Venn Diagram	Rubrics in Individual Learning
Aralin 3 Ugnayan ng Kita, Pag-iimpok at Pagkonsumo	Collaborative	Group Report and Discussion • Manila paper • cartolina • pentouch	Organize Group Report	Rubrics in Reporting and Collaborative Learning
Aralin 4 Implasyon	Individual	Making Self Commitment (Implasyon Post) • Bond paper	Facebook Posts	Rubrics in Individual Learning
Aralin 5 Patakarang Piskal	Collaborative	Pie Graph Construction • Manila paper/ cartolina • Coloring materials	Pie Graph constructed by group	Rubrics in Collaborative Learning
Aralin 6 Patakarang Pananalapi	Individual	Table Completion • pictures	Complete Table	Rubrics in Individual Learning

Based from the table, different activities were performed by Grade 10 students. Three (3) topics were treated as collaborative learning (Aralin 1, 3 and 5) and the other three (3) topics as individual learning (Aralin 2, 4 and 6). Expected outputs were all finished within a given time. Teachers from School A, B and C evaluated their collaborative-individual learning activities based from the rubrics devised by the researcher.

Level of Critical Thinking Skill after the Application of Collaborative-Individual Learning Strategy

After the application of the collaborative-individual learning strategy, the critical thinking skills of the Grade 10 students was improved. Table 4 presents the result of post test showing the mean scores of the students and standard deviation to describe the dispersion. Qualitative interpretation was used to describe the level of critical thinking skills of the students.

Table 3 shows that in School A, Section Aristotle garnered a mean of 29.47 (Good) with a standard deviation of 2.436. Section Soren had now a higher mean of 32.62 (Very Good) with SD=2.411. In School B, Section Zircon garnered a mean of 29.31 (Good) and SD=2.761 while Section Diamond had a higher mean of 35.21 (Very Good). In School, Section Garcia garnered a mean score 25.43 (Good) with SD=3.132 while Section Quezon had a higher mean score 34.66 (34.66) and SD=2.322. Data revealed that the critical thinking skills of the Grade 10 students in Zone IV after the application of collaborative-individual learning strategy was at already "Very Good" level (31.12).

Table 3. Mean Scores of Students on the Post Test

School	Section	N	St. Dev.	Mean	Qualitative Interpretation
A	Aristotle	33	2.436	29.47	Good
	Soren	40	2.411	32.62	Very Good
B	Zircon	36	2.761	29.31	Good
	Diamond	38	2.104	35.21	Very Good
C	Garcia	34	3.132	25.43	Good
	Quezon	34	2.322	34.66	Very Good
Overall Mean				**31.12**	**Very Good**

This suggests that the implementation of collaborative-individual learning had a positive impact on the critical thinking skills of the Grade 10 students.

Difference between Level of Critical Thinking Skills of Students Before and After the Intervention

Table 5 displays the results of the T-test conducted to examine the significant differences in the critical thinking skills of students before and after implementing the collaborative-individual learning strategy.

It can be gleaned from the table that on the pretest, a degree of freedom df=214 at a set alpha level α=.05 had a tabular value of t=1.6449. The researcher formulated a hypothesis that "the mean score on the post test of the students is not significantly higher than the mean score of the pretest."

Data revealed that the computed value of t=3.316 is greater than tabular value t=1.6449, hence rejecting the null hypothesis. Thus, the mean score of the students on the post test is significantly higher than their mean score on the pretest. The value Sig.(2-tailed) =.000 is less than the set alpha level which implied significance of the difference.

Therefore, the level of critical thinking skills of the students had increased after the application of the collaborative-individual learning strategy.

Table 4. T-test between Critical Thinking Skills of Students Before and After the Intervention

Variable	df	Computed t	Tabular t	Sig.	Interpretation
Pretest-Posttest	214	3.316	1.6449	.000	Significant

This affirms the findings of Hanze and Berger (2007) that there are strong effects of collaborative learning on the experience of basic needs, intrinsic motivation and activation of deeper knowledge processing (critical thinking).

Performance of the Three School Before and After Application of Collaborative-Individual Learning Strategy

After the intervention, the researcher identified which among the group of students attained the greatest learning. Table 6 presents the data on comparing the performances of the the students in each schools. The performance of the schools was measured by the differences of means in the pretest and post test.

Gleaned from the table, School A had the test mean difference of 9.52, School B had 9.16, and School C had 11.59. Evidently, School C garnered the highest test mean difference. This implied that the students in School C attained the highest learning after the application of the collaborative-individual learning strategy.

Table 5. Performance of the Three Schools after the Application of Collaborative-Individual Learning Strategy

School A			School B			School C		
Posttest	Pretest	Mean Diff.	Posttest	Pretest	Mean Diff.	Posttest	Pretest	Mean Diff.
30.05	20.53	**9.52**	32.26	23.10	**9.16**	31.05	19.46	**11.59**

This affirms the findings of Ntoumanis (2001) that collaborative experiences allow students to demonstrate leadership and use their choice and decision-making abilities, hence critical thinking skills. It also confirms the findings of Slavin (1995); Johnson, Johnson, and Holubec, 1991) that cooperative learning appears to be well-suited for social studies classrooms because students practice group skills while raising achievement

Conclusion

This study, therefore, concludes that the critical thinking skills of Grade 10 students improved thru the application of collaborative-individual learning as evidenced by the results

of hypothesis testing. There is a significant difference in the critical thinking skills of Grade 10 students after the application of collaborative-individual learning at α=.05 and df=214. School C attained the highest learning due to the application of collaborative-individual learning at α=.05 and df=214.

Recommendation

Economics teachers may consider using the collaborative-individual learning strategy all throughout the Economics course or on other subject to which the intervention may be applied. Teachers may be trained on how to use the collaborative-individual learning strategy without sacrificing the integrity of the learning process. A strict supervision must be done during the collaborative-individual activities to ensure that the students are doing the assigned tasks. Follow-up research may be conducted, applying the collaborative-individual learning to other subject to validate the result of the effect of the intervention. School heads should encourage teachers to use collaborative-individual learning to be one of the primary strategies to be used in school.

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