Standards-Based Concept-Matrix as a Strategy in Deepening the Conceptual Understanding of Grade 9 Students in Economics

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ABSTRACT

This study sought to develop the conceptual understanding of the students in Economics using the standard-based concept matrix as a strategy. The quasi-experimental research causal-comparative research method was used in this study. This involved 46 students from the Grade 9 level who were taking up Economics as a Social Studies subject during the School Year 2023-2024. Purposive sampling was used to select the participants for this research. The validated test papers in the third and fourth quarter periods are the main instruments utilized. This research found that students' conceptual understanding of the topics during the third and fourth quarter periods was deepened. Using the standards-based concept matrix, the students collaborated to discuss the topics. A standard-based concept matrix must be partnered with group activities so that the students will be allowed to think about their answers and listen to their classmates' answers during the process. There is a need to replicate this research with the pretest and post-test to confirm the efficacy of a standard-based concept matrix as a strategy in teaching Economics. The standard-based concept matrix can also be used as a form of assessment, not just as a strategy.

Keywords: Standard-based concept matrix; Economics; Conceptual Understanding

INTRODUCTION

Economics is a subject offered among students in junior high school in the Philippines. This subject aims to develop among the students the competency to apply the concepts of Economics in their day-to-day lives as members of their families and society. This objective can only be attained if the teachers in this subject utilize a strategy that will deepen the student's understanding. To achieve this objective, the researcher decided to use the standards-based concept matrix as one of the strategies to teach the selected topics in economics. The concepts of standards-based teaching or instruction have been explained in different sources. One source states that standard-based refers to academic standards or content standards. Academic standards present what the students should know and be able to do in a certain subject (Schwartz, 2023). Standards are essential in education because they set the vision and the framework for teaching. Standards in teaching are met if the government and the schools provide various opportunities to implement these effectively through aligning assessments with the learning objectives and constantly training teachers.

Aside from the fact that standard-based teaching sets the vision, it also promotes better accountability, which makes the teachers and the school responsible for what happens in the classrooms. According to the Professional Learning Board (PLB), standards-based instruction assists the planning, implementation, and assessment of student learning. Therefore, even the utilization of different strategies in teaching must follow standards. If the teachers teach according to standards, the students are ensured to meet the targets, and it is

easy for the teachers to track students' performance (2024).

Understanding the concept and importance of standard teaching, the researcher decided to apply this in adopting a strategy for teaching Economics. This strategy refers to a standard-based concept matrix. The standard-based concept matrix is used to present the ideas, concepts, and information in an organized manner and anchored from learning competencies in a particular subject. Matrix has been used in the presentation of various topics in different disciplines. It also serves several purposes in teaching and learning situations. Dempsey et al. (1990) explain that matrices perform as a systematic structure for the concept and simple rule learning and higher-order rule or problem-solving skill learning.

The matrix is also valuable for outlining concepts. If this is used in the class, the students can quickly grasp the information they need to explain and analyze. This also trains the students to re-organize their notes and establish connections between and among concepts. In addition, it is also effective in showing comparisons among concepts. It is suggested that the concept matrix must be used after discussing the lessons. It has been proven that this strategy is effective for students with visual learning styles. Although several benefits are determined when a matrix is used in teaching, teachers must also be cautious. It was observed that the matrix is effective when used in independent study. The benefits of this strategy can be fully achieved if the students have prior knowledge about the topics they need to learn (University of Toronto, 2024).

Adopting standards-based teaching with a matrix, the researcher hopes this will deepen the conceptual understanding of students in Economics. Conceptual knowledge refers to the ability of children to grasp information in a transferable manner (Moser and Chen, 2016). It helps students to take what they learned in class and apply it across domains. Conceptual understanding is manifested when students can transfer skills in various situations. It is vital to develop among the students because they can use this in the future, especially when they need to make decisions in an exploratory and innovative way in a novel situation. Students need to be exposed to exploratory learning, which indicates conceptual understanding. Conceptual understanding among the students is developed when they are provided with real-world examples of various professions and embedding learning within. Students must prepare to take abstract ideas to create thoughtful opinions and decisions as they would in future professions (Moser and Chen, 2016).

Furthermore, conceptual understanding is also aimed to be developed in other subjects like Mathematics. It relates to creating a robust framework representing the numerous interwoven relationships between mathematical ideas, patterns, and procedures. This can be used to integrate new knowledge and solve unfamiliar problems coherently. Developing a robust framework is possible through schemas. Schemas refer to blueprints that describe an object, a string of events, an idea, or anything. Building schema relates to conceptual learning according to neuroscience. Schemas are keys to deeper conceptual understanding. Teachers can capitalize on schemas if students are taught about concepts as they are related to one another rather than treating them in an isolated and compartmentalized manner as rigid rules and procedures (Sbar, 2024).

Another way of developing conceptual understanding is through talk. According to Ali (2020), when she applied talks to teaching Mathematics, her students strengthened their understanding. This also gave her valuable information as a teacher, allowing her to adjust her teaching based on what the students know. Aside from this, deepening conceptual understanding is also possible when teachers use multiple representations. In this scenario, the students can make connections between representations (Ali, 2020).

During the first and second quarters, the researcher noticed that some students in his class didn't show active interest and engagement in the class. Only the high-performing students are constantly engaging, participating, and sharing ideas in the class discussion. Being concerned about students' performance and participation, the researcher adopted the standard-based concept matrix during the third and fourth quarter periods. The third quarter period is critical in this study because this is where the initial implementation of

the said strategy happened and exposed the students to the said strategy. On the other hand, the fourth quarter period is the stage when the teacher conducted the study using the standards-based concept matrix. The researcher hopes that through this strategy, the students will develop a deep conceptual understanding of Economics.

This research is anchored on cognitive learning theory. This theory presupposes that students are active learners because they react to the stimuli in the learning environment. It seeks to explain how the brain works during the learning process. The human brain processes and uses information to produce the expected learning outcomes. In the four stages of development, as explained by Piaget, the learners can understand abstract and complex concepts (Padgette, 2020).

The standard-based concept matrix was adopted so the students could process, analyze, and explain economic concepts. The teacher presented the learning objectives to the students during the lesson presentations. These learning objectives were used as bases for crafting a standard-based concept matrix to deliver the lessons and provide opportunities for students to be engaged during the third and fourth quarter periods. During the lesson presentations, the teacher presented the concept matrix to the students in a way that aligned with the lesson. The students were allowed to work on this concept matrix as a group. After the students work on this concept matrix, they will explain the information they processed and analyzed to the class.

METHODOLOGY

Research Design

This research utilized a quantitative research method. The quantitative research method includes analyzing and gathering numerical data to uncover trends, calculate means or averages, evaluate and see the relationships among variables and data, and derive insights from all these. It utilizes statistical treatment or tools to analyze and interpret numerical data. This is also known as systematically investigating phenomena by gathering quantifiable data (Question Pro, 2024). Specifically, this research utilized quasi-experimental and causal-comparative research methods. Causal-comparative is used if the nature of research is to identify the cause-and-effect relationship between two variables, where one variable is dependent and the other is independent (Market Research Solution: 2024). This research is quasi-experimental because it only involved one group of students in Economics who were not randomly selected since they were the class handled by the researcher during the school year 2023-2024.

Furthermore, causal-comparative is also an applicable method in this research since the researcher utilized the standard-based concept matrix as a strategy for this group of students during the third and fourth quarter periods. The researcher would like to find out if this strategy will deepen the conceptual understanding of the students in Economics during the two-quarter periods. The third quarter period has eight weeks of meetings, which covers the months of January 2024 to March 2024, while the fourth quarter has a similar number of meetings from March 2024 to May 2024. In the third quarter period, they covered topics such as the economic cycle, the sectors that comprise the economic cycle, the gross national product, inflation, fiscal policy, monetary policy, and income and savings. On the other hand, the fourth quarter period covered economic development, the agricultural, industrial, service, and global economies. At the end of each quarter, the researcher administered the validated tests to the students.

Research Locale

The study was conducted at Holy Trinity Academy, a Parochial School in Manila. The school has existed for 77 years and continuously aspires to provide excellent service to its clients. The Basic Education Department is accredited Level II by the Philippine Accrediting Association of Schools, Colleges, and

Universities. The school had more than 2,500 students during the school year 2023-2024.

Research Participants

The participants in this research are the Grade 9 students handled by the researcher in Economics during the school year 2023-2024. Twelve (12) male students and thirty-four (34) female students comprised the class. A purposive sampling technique was used.

Research Instrument

The instruments used in this research are the third—and fourth-quarter examinations, which were validated based on the learning competencies developed during those quarters. The test papers were checked and validated by the school principal and the subject area coordinator in Social Studies to determine the alignment of the questions with the learning competencies to be developed among the students during the third and fourth quarters.

Data Gathering Procedure

The researcher ensured that the Office of the Principal submitted and approved a letter of permission to conduct the study. The parents of the students selected as participants in the research were informed through a letter, and their consent was sought to allow their children to participate.

Ethical Considerations

This research followed ethical standards. The school administrators, the parents, and the students were assured that the data to be gathered would be used in the study and treated with utmost confidentiality. The researcher ensured that the participants would not be harmed during this research.

RESULTS AND DISCUSSION

Table 1: Performance of the Students in the Third Quarter Test in Economics

Range	Frequency	Percentage	Description
41-50	25	54.35	Highly Deepened
31-40	15	32.61	Deepened
21-30	5	10.87	Moderately Deepened
11-20	1	2.17	Slightly Deepened
N	**46**	**100**	
Mean	**39.72**		**Deepened**
SD	**7.26**		

Table 1 presents the test performance of the students in the third quarter test. It must be noted that this period has an eight-week meeting. This was when the researcher started to utilize the standard-based concept matrix to deepen the conceptual understanding of the students in Economics. This strategy was used in the topics covered during this quarter. It can be gleaned in the table that 25 students, or 54.35 percent of them, got scores within the range of 41-50. The performance of these students is described as highly deepened.

On the other hand, 15 students, or 32.61 percent, achieved scores within the range of 31-40. This is described as deepened. Meanwhile, five students, or 10.87 percent, whose scores fall from 21-30 and are

described as moderately deepened. Lastly, one student, or 2.17 percent, whose score is within the range of 11-20 and is described as slightly deepened.

Table 2 Performance of the Students in the Fourth Quarter Test in Economics

Range	Frequency	Percentage	Description
41-50	25	54.35	Highly Deepened
31-40	17	36.96	Deepened
21-30	4	8.70	Moderately Deepened
N	**46**	**100**	
Mean	**39.67**		**Deepened**
SD	**5.16**		

Table 2 shows the students' test performance during the fourth quarter period in Economics. It can be gleaned that there are 25 or 54.35 percent among them whose scores are within the range of 41-50. This is described as highly deepened. Meanwhile, 17 or 36.96 percent of the scores are within the range of 31-40 and are described as deepened. Lastly, there are 4, or 8.70 percent, whose scores are within the range of 21-30 and described as moderately deepened.

The mean score of the students in the fourth quarter test is 39.67, described as deepened with a standard deviation of 5.16, indicating that their scores are close. The mean score in the fourth quarter is relatively lower than that of the students in the third quarter. Nonetheless, the mean scores yielded by the students in the third and fourth quarter periods are both described as deepened, indicating that the students sustained their performance in Economics and deepened their conceptual understanding of this subject.

Table 3 Significant Difference in the Performance of the Students in Economics in the Third and Fourth Quarter Tests

Test Periods	Mean	Standard Deviation	z-critical value	Z-computed Value	Interpretation	Decision
Third Quarter	**39.72**	**7.26**	**1.96**	**0.096**	**Not significant**	**Accept the Null hypothesis.**

Table 3 presents the significant difference in the test performance of the students in Economics during the third and fourth quarter periods. With a mean score of 39. 72 and 39.67 in the third and fourth quarters, respectively, and standard deviations of 7.26 and 5.16, the computed z-value yielded is 0.096, lower than the z-critical value of 1.96. Hence, there is no significant difference in the student's test performance in the third and fourth quarter periods, and the null hypothesis is confirmed. This result suggests that using a standard-based concept matrix in teaching the topics covered in the third and fourth quarter periods yielded similar test performance among the students. Their conceptual understanding of Economics is deepened through this strategy. However, it is noted that the mean score of the students in the third quarter test is slightly higher compared to the fourth quarter. In addition, it is observable that more students in the fourth quarter test whose scores are described as deepened and highly deepened. This indicates a slight improvement in the student's test performance during the fourth quarter. Further study on the efficacy of this strategy towards deepening students' conceptual understanding is recommended.

CONCLUSION

The students' conceptual understanding deepened during the third quarter period based on the number of

students who got scores between 41-50 and 31-40, both described as highly deepened and deepened. Only one student whose score is within the range of 11-20 or described as slightly deepened. Using a standards-based concept matrix, the students were taught the topic of economics anchored from the standards. During the implementation, the students can also think about their understanding of the topic and collaborate during the discussions.

The students' conceptual understanding is deepened during the fourth quarter period. There is a gradual change in the performance of the students. Most students got scores within the range of 41-50 and 31-40, described as highly deepened and deepened, respectively. Four students' scores are within 21-30 or described as moderately deepened. The scores of the students in the fourth quarter test yielded significant results since no one got scores within the range of 11-20 or described as slightly deepened. The students were taught to think about the topics using the standard-based concept matrix during this period. The students collaborate to explain the different concepts presented through this strategy.

The conceptual understanding of the students is deepened when utilized according to the standards. The researcher recommends using a standard-based concept matrix to be partnered with group activities. By doing so, the students will not only think of their answers, but they will also get the opportunity to hear the insights of the other students in the process. There is a need to replicate this research with the pretest and posttest to confirm the efficacy of a standard-based concept matrix as a strategy in teaching Economics. The standard-based concept matrix can also be used as a form of assessment, not just as a strategy.

CONTRIBUTIONS OF AUTHORS

The author's name appeared in this research and has solely conducted and prepared this research. He is the sole author of this paper, and no other people contributed to completing this research.

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CONFLICT OF INTERESTS

The author declares no conflict of interest in the publication of this paper.

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