



Classroom Action Research Journal 3(2) (2019) 25-34

Classroom Action Research Journal

<http://journal2.um.ac.id/index.php/carjo>

Concept Mapping Strategy in Teaching Learning Economic Concepts and Perception of Students on Teaching Learning Economic Concept Through Concept Mapping

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DOI: 10.17977/um013v3i22019p025

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History Article

Received 19 April 2019

Approved 30 May 2019

Published 7 June 2019

Keywords

Concepts, Concept Mapping, Test, Teacher, Teaching Learning

Abstract

This study aim to investigate the effect of using concept mapping in teaching learning process for teachers and students. The study was carried out in XI Arts at Dechencholing Higher Secondary School under Thimphu Tromde, Bhutan with 35 students. The study was a mixed method. The quantitative data collected through class (pretest and posttest) test were analyzed and interpreted using descriptive statistics such as mean and standard deviation, and inferential statistics such as t-test and level of confidence and statistical significance. The qualitative data collected though observation of group works and presentation, and group reflective journal were analyzed by coding and thematic analysis was drawn to analyze the data. The findings showed concept mapping plays an important role in teaching learning process and has positive opinion towards concept mapping usage. It enhances descriptive ability, understand and help to remember concepts, build confidence and enhance active participation in the classroom. However, all concept cannot be taught through concepts mapping. It is also not always easy to construct all concept map. Teacher should encourage students to continue with concept mapping before students master the technique of concept mapping.

How to Cite

Dorji, T (2019). Concept Mapping Strategy in Teaching Learning Economic Concepts and Perception of Students on Teaching Learning Economic Concept Through Concept Mapping. *Classroom Action Research Journal*, 3(2), 25-34.

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e-ISSN 2598-4195

INTRODUCTION

Various studies done on the Bhutanese education have pointed out the need to address issues on quality of education (GNHC, 2019). The diagnostic standardized test conducted by the Royal Education Council & Education Initiatives Private Limited (2008) in 18 schools for class V, VII and IX in Science, Mathematics and English revealed that student was unable to perform basic numeracy and literacy tasks and their learning outcomes were below the minimum expectations of their grade levels. Majority of students were unable to understand core concepts and apply knowledge in real-life situations. Students are found making simple mistake in question related to procedural learning and application. Most students fail to relate what student have learned to their environment (Namgay, 2006). The Education Sector Review Commission (2008) revealed that there was high primary school grade repetition. Students are not able to master their curriculum within the prescribed time. The World Bank (2007) as cited in (Ministry of Education, 2014) found that the overall rate of learning was low in grade level II and IV of primary schools of Bhutan. Similarly, the Program for International Student Assessment for Development (2018) in Bhutan revealed that students in general have higher success rates in items requiring lower cognitive skills. There is significant gap in performance in more demanding tasks. Bhutanese students have performed at par with top PISA-D countries but significantly below OECD average. I strongly believe that the lower rate of learning in lower classes have direct impact on higher class. The Ministry of Education (2014, p. 29) shows that “the overall performance of Bhutanese children is challenged in meeting not only the international standards, but also of the national standards”. Several studies reveal shortcoming in learning outcomes, skills and teaching learning practice (GNHC, 2019). Therefore, it is very important for teachers to use child-centered teaching and learning, assessment approaches, classroom practices to promote understanding in all learners (Ministry of Education, 2014; Dorji, 2018). Over the years, there has been a change in the delivery of lectured from mere talk or one way teacher transmission to learner or child-centered teaching and learning. A teaching focused more on students, collaboration, reflection, group discussion make students think critical. Teaching become more interactive and rewarding (EFA Global Monitoring Report, 2013). The same issues have also been discussed and validated in the Bhutan Education Blueprint 2014-2024 (Ministry of Education, 2014). Providing quality education is critical for furthering the progress of human development in the country (Planning Commission of Bhutan, 2007).

This action research intended to try out the concept mapping as an intervention program in teaching and learning economic concepts and understanding the relationship between abstract concepts and how such practices helped students improve their learning and academic achievements. The literature shows concept mapping is used to teach concepts, facts and ideas in the context of cross cultural teaching and learning. The concept mapping is found more valuable than tradition lecture teaching strategy (Alhomainan, 2015) and make teaching learning process interesting and more meaningful. I hope teachers are aware and

familiar with concept mapping. Even if teachers are aware and familiar with the concept mapping, it would be of good use to brush-up their knowledge to better pay attention to concept mapping strategy in teaching. The findings from this study might help other teachers in designing appropriate methodologies or strategies to teach concept to the students or learners.

Aim and Objective of the Action Research

The aim and objective of the action research were to:

1. try out and examine concept mapping in teaching and learning economic concepts.
2. investigate the academic performance of students by incorporating concept mapping.
3. assess the views and opinions on learning economics concepts by incorporating concept mapping.

Situation Analysis

Dechencholing Higher Secondary School is located in Thimphu Thromde. There are 74 regular teachers (21 male and 53 female, 6 contract teachers (5 male and 1 female), 1 male substitute teacher, 8 student teachers (4 male and 4 female), 9 non-teaching staff (4 male and 5 female) and 6 supporting staff (63 male and 3 female). The school is a co-educational day school with an enrolment of 1813 students (850 boys and 863 girls) ranging from classes PP to XII. The school offers science, commerce and arts stream. The management, teachers and students are striving for academic excellence although the outcome of class XII board examinations was not encouraging and satisfactory despite collective commitment, hard work and efforts initiated by the school.

Currently, I teach Economics in class X, XI and XII. Economics require lot of effort to understand and remember concepts, facts and ideas (Dorji, 2018). I have come across many economics students fail to understand and remember the economic concepts. I believe that an affective teaching strategy is the bedrock of an effective learning. The quality of teaching strategy has direct relation to the quality of student performance. In order to make students learn effectively, the teacher should adopt right teaching strategy (Yadav, 2006). After going through literature review I felt it is necessary for me to carry out action research on teaching economic concept through concept mapping. Concept mapping enable both students and teachers to use visual perception in learning concepts and remembering economic concepts (Tenzin, 2005).

Competence

I have attended three-day professional development program on Action Research organized by Dechencholing Higher Secondary School in collaboration with REC and Thimphu Thromde. The action research was facilitated by the Research Division under the Royal Education Council. I also had support from the

school management and colleague teachers. I have been faculty in teaching profession for the last 14 years teaching economics for class X, XI and XII. During last 14 years, I got a good opportunity to re-examine and reflect on the trend of teacher-centered teaching and learning approaches in the school.

Critical friend

Mr. Tshering Wangchuk, a history teacher has accepted the role of critical friend in action research. My critical friend poses good research knowledge. He has attended a research module during his graduate studies at Paro College of Education. He has also attended three-day professional development program on Action Research organized by Dechencholing Higher Secondary School in collaboration with REC and Thimphu Thromde. The purpose of having critical friend is to overcome narrow or biased interpretation of data made by researcher. Critical friend acted as another bigger lens who gave advice, suggestion and ask provocative questions (Royal Education Council, 2018).

METHOD

Mixed method was used by using quantitative and qualitative data to carry out this action research. The qualitative data was collected through the observation of group work and group presentation and students' group reflective journals. The quantitative data was collected through Autumn Test (pretest) and class test (posttest) to evaluate the effects of the intervention program. The qualitative analytic method used was thematic analysis.

This action research was carried out with 11 Arts students. Students age ranged from 18 to 20 years. There were 35 students (11 Boys and 24 Girls in the class. Out of 35 students, all boys (11 students) and 19 girls had not taken Economics in class IX and X. They were studying economics for the first time in class XI. All students were not familiarizer with learning and remembering concepts through concept mapping. The chapter 'Demand' was chosen because demand is important concept of market forces. 20 Periods of 45 minutes were allocated for the study. I briefed the purpose of my action research to the XI Arts. Study approval was obtained from the school management. Consent was also obtained from all students and confidentiality was assured. All students agreed and participated in the action research. The data collected through pretest and posttest were as follows:

Baseline (Pretest) data collection

Autumn Test

The base line data was collected through Autumn Test on September 25, 2019. The objective of Autumn Test was to determine the level of knowledge that students owned prior to the implementation of concept mapping as intervention program. The twenty marks of short essay type questions covered after midterm paper were prepared. The 20 marks were later converted into 100 marks for easier tabulation. The writing time of Autumn Test was 40 minutes. The first chapter

'demand' in class XII was taught by incorporating concept mapping strategy because the class XI economic syllabus was completed.

Post data collection

i. Class Test

After the completion of demand chapter class test was conducted on November 15, 2019 to assess the student's level of academic performance in economics after using concept mapping as intervention program. The class test consists of similar question carrying same marks with same writing time of Autumn Test. The class test was also used to examine and compare the students' level of academic performance between Autumn Test and class test.

ii. Group Work and Group Presentation

During the lesson, group work and group presentation were assigned to each group. There were seven groups consisting of 5 members each. The objective for administering group work and group presentation was to investigate and examine students interest and participation in group activities and their level of understanding during three-week intervention program.

iii. Student Group Reflective Journal

The seven groups consisting of 5 members each were also asked to write a reflective journal about how they felt, experienced and learned demand concept, facts and ideas through concept mapping. The purpose of writing reflective journal was to find out the views and opinions towards economic concepts, academic performance and their learning satisfaction after incorporating concept mapping as teaching strategy. Group reflective Journal also provided information to the teachers how students have progressed with concept mapping. Journal promote reflective thinking and generate further questions (Bybee, Powell & Trowbridge 2008).

Data Analysis

The quantitative data collected through pretest and posttest, Autumn Test and class test were analyzed using SPSS version 24. The descriptive statistics such as mean and standard deviation and inferential statistics such as t test, statistics significance and level of confidence were determined. Similarly, qualitative data collected through group work and group presentation and students' group reflective journal were analyzed by using coding system. After coding, themes were generated (REC, 2018). Data collected through different methods were triangulated to confirm results and findings.

RESULTS AND DISCUSSION

The analysis of the pretest and posttest revealed that there is significant difference between the two means, the mean of posttest being higher. The findings from Table 1 support the previous findings mentioned in the literature that concepts taught through concept mapping have positive impact and using them systematically could improve the teaching learning process. There is a statistically significant difference between pretest and posttest. As seen from Table 1, the pretest scores revealed that most students had weak understanding of concepts. The improvement of posttest score proves that concept mapping has positively affected learning economic concepts.

Table 1. Descriptive and inferential statistics of pretest and posttest

Test	N	Mean	Std. Deviation	Test Value=0					
				T	Df	Sig.(2-tailed)	95% Confidence Interval of the Difference		
							Lower	Upper	
Autumn Test (Pretest)	35	45.79	16.536	16.381	34	.000	40.11	51.47	
Class Test (Posttest)	35	62.97	14.460	25.763	34	.000	58.00	67.94	

Similarly, the analysis of the group work shows that initially students were not aware of concept mapping. All group members were confused with flow diagram and concept mapping. After three classes, students were cleared about concept mapping strategy. It was observed that all students in the group participated in the group work and showed keen interest in group presentations. Students clarified their doubts. Overall I found students enjoyed concepts taught through concept mapping. Similarly, the analysis of students' group reflective journal showed five themes. The students were in favor of learning economic concepts through concept mapping.

1. Descriptive ability

Concept mapping strategy helps students in the improvement of their descriptive ability. One group mentioned "concept mapping is mainly done by mentioning all the important points about a particular concept or topic and later students can supplement with points by detailing information. In other it helps students to describe more about topic whereby students analytical thinking power are enhanced".

2. Understand and remember concept

Concept maps are important to promote learning with understanding. Concept map helps students to understand and remember concepts for longer period of time. Memory retention becomes higher when learning is done with understanding. One group mentioned "concept mapping helps students in improving sentence structures and grammar skills by describing the key points. Through concept mapping, student found that they were more able to understand more on particular topic or concepts". As students construct concept maps, students attempt to relate new knowledge to their existing knowledge.

3. Build confidence

Through group work and presentation, students gain confidence as they present their group findings to the whole class. Concept mapping provide platform for brain storming. Learning economic concepts through concept mapping enhances students communicate new ideas clearly. Two groups mentioned that, concept mapping was a great way to build upon previous knowledge by connecting new information. The students were passionate about learning new concepts and it broadened their knowledge.

4. Active participation

Students agree that there was active participation among the group members. The group discussed and asked questions related to concepts taught in the class. All group members didn't feel bored and monotonous during the lesson. All group mentioned "we enjoyed learning concepts, facts and ideas through concept mapping. It makes us active and the learning became somewhat fun". All students agree that all concepts, facts and ideas cannot be taught through concept mapping.

5. Test score

Concept mapping helps students revise lessons and prepare for examination. During revision students read text linking concepts or draw and study links between concepts. Three group members mentioned, concept map make it easier to recall the lesson or topic and review the information presented in the class.

The findings go along what was mentioned in the literature and agree with results mentioned by Tenzin (2005), Fahim & Hiedari, (2006), Alhomaidan, (2015) & NCERT. (n.d.).

Reflection

Through group work and group presentation I have learned that there are a variety of ways of representing concepts through concept mapping. I found few students memorizing concept map, copying concept map from the group members. I felt it is very important for teachers to note and discourage students for memorizing concept maps, copying concept maps from groups or friends. The main purpose of using concept mapping strategy is to promote learning through understanding and deemphasize rote learning (Cliburn, 1990). Students can revise the lesson or prepare examinations by linking text with important concepts or study links between concepts. Concept mapping is a useful tool for assisting note taking from reading and teaching.

I felt that teachers need to plan group activities and supervise group

activities properly. Teachers as facilitators should facilitate students' learning. Students should be encouraged to reflect upon concept mapping and promote meaningful learning or learning with understanding (Cliburn, 1990). Although students found concept mapping very useful, I found that the concept maps are not easy to construct and teachers should encourage students to persevere before students master the concept mapping techniques. In few occasions, I found some students known more on a topic and students illustrate concepts with many links for the topic. In such situation, teacher should interfere and remind what students need to do in order to meet the learning objective of the lesson (Tenzin, 2005).

The use of color is very important in concept mapping. During group presentations, I found all groups used limited marker pens. Due to limited number of color pens used, the concept maps were shown either in bicolor or tricolor. Therefore, it is very important for students and teachers to use different set of colors, especially if possible different color for different groups. If different set of colors are used by different groups, a concept map will look attractive, interesting and promote authentic learning (NCERT, n.d).

CONCLUSION

Based on the findings and triangulation of data from different, I conclude that concept mapping has positive effects on higher secondary students learning economic concepts and improving test scores. From my experience, I recommend other Economics teachers to use concept mapping in their teaching learning process. Although teaching economics in higher secondary classes is a challenging job, it is possible for teachers to modify own teaching strategies by incorporating concept mapping strategy to suit the diverse learning needs and interests of students. The instructional role played by teachers has positive impact on students learning (Yadav, 2006).

However, in concept mapping teaching strategy, teachers should discourage students from copying concept mapping or memorize concept maps for examination. It should be a strategy to 'de-emphasize rote learning' or to promote 'learning through understanding' (Cliburn, 1990). There is also a note of caution for all teachers while using concept mapping in teaching concepts. According to NCERT (n.d, p. 185) "while constructing the concept map a student can easily forget the objective of such an activity and as a result by losing the path the student may get involved in useless drawings. The teacher should, therefore, develop an idea beforehand about what the teacher expects from students and remain vigilant in the class to guide and facilitate students so that the right objective is achieved within stipulated time".

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