

Study of Effectiveness of Concept Attainment Model of Teaching on Academic Achievement in Economics

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Abstract

One of the major problems in teaching economics is students' failure to get mastery of economics concepts. To develop conceptual understanding among students dynamic methods of teaching are needed. Study aimed to provide a method of teaching economics other than traditional method. Effect of concept attainment model of teaching on college students' academic achievement level was investigated. The experiment (ABA single subject design) was conducted in a public college of Punjab province. To conduct the experiment lesson plans covering the content from Grade XI economics book were developed and achievement tests were constructed. In baseline, instruction continued through routine instructional method, while in intervention phase, concept attainment strategy was used to teach economics concepts. In withdrawal phase, baseline conditions were reestablished. Results of repeated measures one way analysis of variance revealed that concept attainment teaching strategy is more effective than traditional method to teach economics. It was recommended that new teaching techniques should be included in the curriculum of economics to make the concept attainment easy and interesting.

Keywords: Effectiveness, Economics, Concept Attainment, Concept Attainment model

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Introduction

Education is a tri polar process which revolves around student, teacher and curriculum. Process of education succeeds when it is well planned and thoroughly executed. In the process of teaching and learning, the teacher is crucial. What we aspire to achieve via education determines the subject we choose and the instructional strategies we use. Goals of education have shifted over time, and teachers have worked to improve teaching methods in every era. What we want pupils to know and do determines the instructional style. The improvements have changed the way teaching is perceived. The process of concept attainment and development can make the achievement of educational objectives possible.

The process of stating the definition of a concept by identifying the critical features and distinguishing between examples and non-examples is known as concept attainment. Teachers in today's world should use a variety of dynamic teaching approaches to fulfill the needs and demands of the moment, and they should become adept at implementing these strategies (Joyce et al., 2008). The method employed for teaching should be a mean to cater learner's needs, develop the required behavior, maximize learning, help in acquisition of knowledge and develop complex skills like logical reasoning, critical thinking and creativity. Teaching models help teachers to make it possible by maximizing learning.

In past decades, various methods of learning have been designed and applied for effective learning. Instructional and nurturing effects determine the effectiveness of teaching and learning model. Economics involves abstract ideas and concepts. In order to make teaching of economics more meaningful to the learners, new methods and techniques are needed. Teaching method adopted should help the learner in processing the information in meaningful way and retaining it for a longer time. Hence, the students will be able to attain the concept and apply it in various situations of life.

Various teaching models have been designed by Joyce and Weil (1972) depending on the objectives of teaching. Joyce and Weil (1972) defined teaching models as "a plan or pattern that can be used to shape curricula, to design instructional material and to guide instruction in classroom and other setting". Concept Attainment Model (CAM) is an effective model for teaching concepts and to help students in efficient learning. Concept attainment model is based on concept attainment theory presented by Bruner et al. (1956) in the book '*A Study of Thinking*'. Bruner (1960) defined concept attainment as, "process of finding predicative defining attributes that distinguishes examples from non-examples". Cognitive activity that is considered necessary for

learning concepts led to development of concept attainment model. He emphasized that learning process goes well if an instructor provides students a chance to find a rule (definition) for concepts. In that way students are guided inductively through examples that describe the rule, to understand the common truth (Joyce et al., 2008).

The model has been developed to help learners in attaining concepts by comparing and differentiating the exemplars that contain the essential features of a concept and exemplars that do not contain these features (Joyce & Weil, 1972). The model assumes that the best way to learn the concept is observing its examples. The model not only informs about the nature of concept but also strategies to acquire them (Galotti, 2000).

The process of concept attainment has been developed in line with the Bruner's theory of concept. He identified name, example, attributes, attribute value, and rule as the basic elements of concept. For process of concept attainment teacher needs to follow these steps:

1. Select and define the concept
2. Select attributes of concept (essential & non-essential)
3. Search for positive and negative examples
4. Introduce the topic without telling name of concept
5. Example presentation (positive & negative) and attributes listing
6. Enable students state a definition
7. Give additional examples
8. Discuss mental strategies with students
9. Evaluate

Joyce and Weil (1972) used these elements and steps to develop a model of teaching that is useful for learners in digging and classifying information and development of language to express it. Structural framework of model involves following elements (Joyce et al., 1999):

Syntax

This element describes the phases of model. According to Joyce and Weil (1972), the concept attainment has three variations. Model has same conceptual base but differ on activities in these three variations which are describes as follows:

Reception - oriented model

Students are given labeled yes and no examples in a reception oriented approach, and their objective is to discover the common characteristics of yes instances and distinguish between positive and negative examples.

Selection - oriented model

In selection oriented model unlabeled examples are provided, along with identification of features students also categorize the positive and negative exemplars.

Unorganized materials model

Group discussion is distinctive feature of unorganized material in which teacher plays a role of a facilitator for concept attainment. It is more inductive in nature and more responsibility lies with students. Moreover, unorganized data is used and concept attainment is transferred to situation in real life.

Whichever variation is used; there are three phases of concept attainment (Joyce et al., 2008):

Phase I: Presentation of data & identification of concept

In this phase examples and non-examples are provided in two columns. The examples can be in the form of people, flashcards, sketches, pictures, events, diagrams, or any other units. Students are engaged in thinking and formulation of hypotheses. Students verify hypotheses according to the critical features of concept. Students compare exemplars and non-exemplars and name concept in their mind.

Phase II: Testing attainment of the concept

More examples without putting them into two columns are provided to students. Learners' task is to put the example in right column. Teacher confirms or rejects the hypotheses formulated by students and students name the concept and restates the definition if needed.

Phase III: Analysis of thinking strategy

Instructor provides or refines the definition of the concept and provides the summarizing content. Students discuss with teacher the concept attainment strategies

they used to reach the concept (Bhargava, 2016). Learners discuss about the hypotheses formulated, accepted or rejected. Also, they describe the thinking strategies used to identify the essential attributes of the concept and also their thoughts about the desired concept. Thinking strategies used by students are evaluated by teacher and merits of these strategies are discussed.

Focus

The focus of concept attainment strategy is on attainment of concept. Categorization activity is used for attaining the concept when a concept is related to some broader category. The task entails identifying events and categorizing them according to specified characteristics (Bhaskara, 2018).

Social System

Choosing, analyzing, organizing, and sequencing of examples as well as concepts, is the responsibility of teacher. Books, reading material, notes and internet sources can be used to search for the idea and examples before teaching lesson in the class (Bhaskara, 2018).

Support System

Attributes identified and described by students can be enlisted on board or recorded by other means by teacher. During instruction stress is put on learning the concepts that already exist not on forming new concepts (Joyce & Weil, 1996).

Principle of Reaction

Role assumed by teacher in teaching and learning process is that of facilitator. When it comes to the creation of hypotheses by students, the teacher is encouraging. By emphasizing on the basic features of notion, the teacher also fosters a dialogue in which students test their assumptions against each other's (Joyce et al., 2008). He guides students through the process of analyzing hypotheses and discussing the thinking strategies that were utilized to arrive at the concept.

Application

The model can be used for students of different grade levels and ages. It has the ability to be utilized for both instructional and assessment purposes. Furthermore, it is regarded as a great instructional tool because it is effective at presenting new concepts

and tying them to previously learned ones. It can be used to introduce and explain economic principles such as capitalism, socialism, and democracy (Joyce et al., 2008).

Attainment of Economics Concepts

Economics is taught in Pakistan at secondary and higher secondary school level. It is important not only for students but for society at large because it cuts across all fields of human activity. As far as education is concerned, it has relevancy to science and art. Study of economics enables an individual to think in a way that he/she is able to solve real life problems by applying principles of economics and avoiding risks. It also allows individual to understand relationship between him and other human beings for making efforts for survival.

All over the world, importance of economics as a tool of nation's economic development cannot be overstated. Learning of economics is vital for making qualified and specialized manpower available for growth and development of economy. Sound knowledge of economics not only provides an individual his source of revenue but also a chance to better the lives of many others in the economy. Because economics teaching is focused on equipping students with the basic concepts of subject necessary for higher education and useful living (Paul et al., 2018). Abstract ideas taught in economics are difficult to abstract attain. Remembering only name of concept is not concept attainment, defining concepts and categorizing them according to essential characteristics is also necessary. Identification of critical features is necessary before stating the definition of concept. Basic concepts of economics help students in understanding of secondary and tertiary concepts, basic concept clarity is mandatory before proceeding to the next concept.

Scenario in Pakistan is not different from the other world. Knowledge of economics is necessary to alter the conditions of Pakistan economy. But the educational system here is facing crises in the instructional management (Ahmad et al., 2014). Frequent use of inappropriate teaching strategies is prevalent especially in public educational institution which is considered the drawback of educational system (Memon, 2007). Like other subjects economics is also taught through traditional method that does not help students get conceptual understanding and develop a rational behavior that can raise his quality of life. To achieve the objectives of economics as subject, it is imperative that students learn concepts of economics efficiently and grasp the meaning of concept easily. Effectiveness of concept attainment model reported by many studies for different subjects led researcher to evaluate effectiveness of concept attainment strategy for teaching economics concepts.

Review of Related Literature

Different researcher from the past to present conducted studies on concept attainment model in order to evaluate its effectiveness for different grade levels, age groups, ability level and subjects. Concept attainment model was used for teaching Arabic grammar to ninth class students by Shamnad (2005) and proved its effectiveness. Similarly, knowledge retention of history was improved by using concept attainment model in (Twyman et al., 2006). Relative effectiveness of concept attainment model and conventional method was compared by Kalani (2008) for teaching and retaining science concepts and found concept attainment model more effective than conventional teaching method. Aruna and Smitha (2009) measured the effectiveness of concept attainment model in biology by forming experimental and control group. They reported that achievement of experimental group remained higher than control group. A study analyzed the influence of the concept attainment model of teaching on mental processes as well as science ability, and found it successful in boosting reasoning ability and general science ability (Singh, 2011). Mayer (2012) employed a concept attainment model combined with inductive reasoning to teach biology to high school students, and found that using the concept attainment model improved students' grasp of concepts and thinking skills. Kumar and Mathur (2013) contributed a year later by examining the impact of CAM on the learning of physics concepts in Grade 9 and discovering a substantial difference between concept understanding using the concept attainment model and traditional methods. Rani (2015) compared two models for teaching English grammar, namely the idea attainment and memory models, to the traditional technique and concluded that the concept attainment and memory models were more effective than the traditional method. Use of concept attainment model beyond school and college was made by Suleiman (2016), who used it as a training strategy and observed workers attained higher mean score on the post test. Kaur (2017) taught secondary school physics students using concept attainment strategy and reported improvement in achievement score. Alam (2017) also used concept attainment model for teaching science to secondary school students and reported similar results. In another study with different subject Kaur (2018) found concept attainment model effective for teaching chemistry to secondary school students.

Other than science subjects, a study on social science was conducted by Praveen (2018) on 9th class students. There was a significant change in achievement scores between the experimental group's pre and post tests. In the post-test, a significant difference was determined between the experimental and control groups' achievement levels.

Angraini et al. (2018) used a concept attainment technique to improve mathematical analogical reasoning capacity of university students, and they reported an increase in students' mathematical analogical reasoning ability. Angraini et al. (2019) attempted to improve university students' mathematical generalization thinking in their next study. In order to strengthen mathematical generalization thinking, a connection between the concept attainment model and prior mathematical knowledge was discovered. The relationship between the idea attainment model and prior mathematical knowledge for boosting mathematical generalization ability was discovered in this study.

Habib (2019) also conducted study on social sciences but at Grade XII. Each group was made up of a broad sample of 400 students who were chosen at random (experimental & control). The study's findings demonstrated that the concept attainment model is also beneficial to pupils in terms of achievement in social sciences.

In another study, Angraini (2019) looked at the impact of a concept attainment model on university students' low mathematical communication skills. The idea attainment model was found to have a favorable impact on mathematics communication skills.

Yumiati and Haji (2019) aimed to improve pre-service teachers' knowledge of the semi-group idea. For this, a one group pre- post-test design was adopted. The concept attainment model was used to develop pre-service teachers' ability to understand the semi-group idea.

Various researches conducted using concept attainment model depict that achievement score of students improves when taught through this model. Still, research studies examining the effectiveness of concept attainment model of teaching economics at college level are nil or few in number. Thus, this insufficient research in the subject inspired the researcher to conduct the present study to evaluate the effect of concept attainment model of teaching on academic achievement in economics.

Objective of the Study

Major objective of the study is:

To measure the effectiveness of concept attainment model based instruction on Grade XI students' academic achievement in economics.

Null Hypotheses

Following research hypotheses were tested:

H01: There is no significant effect of concept attainment model based instruction on students' achievement in economics at college level.

H02: There is no significant mean difference in level of students' achievement in economics during baseline, treatment and withdrawal phase.

Research Instrument

Nine achievement tests of economics were developed by researcher to measure four levels (knowledge, comprehension, application & analysis) of cognitive domain of Bloom's Taxonomy. Content from book of economics published by PCTB was used to develop the achievement tests. Each test was covering the content that was taught during those two weeks. Items were developed focusing the name, definition, attributes and examples of concept. Use of concept in other situations and relations with other concepts was also considered during test development. Item analysis was done to make the test valid. Content validity of test was ensured through table of specification and reliability coefficient for each test was as given in table 1:

Table 1

Reliability Index for the Academic Achievement Tests of Economics

Achievement Test	α value
1	.80
2	.88
3	.92
4	.90
5	.94
6	.89
7	.91
8	.93
9	.91

Intervention

Lesson plans were developed for the intervention phase according to objectives of concept attainment model of teaching. Lessons were planned for 26 concepts of economics according to the phases of concept attainment model. Lesson plans developed for study were 20. Concept definition attributes of concept, and examples of concept were focused for lesson plan development. Flash cards and charts were used during classroom instruction to engage students and to make concept attainment easy and efficient.

Research Design and Procedure

Researcher used single subject ABA withdrawal design. One section (52 students) of Grade 11 from a public college was selected through intact group sampling. Experiment continued for eighteen weeks. Students were administered a test after every two weeks. In first six weeks students were taught through conventional method of teaching economics using board, marker and textbook. Students were taught using concept attainment model of teaching for six weeks using flash cards and charts containing examples and non examples. The focus of instruction in intervention was on attainment of concepts. For that purpose, 26 concepts were selected to be taught through concept attainment strategy. Again, students received instruction through conventional method for six weeks. Three measurements were taken in each phase by administering the test covering the content taught during those two weeks. Students' achievement scores obtained in each test were recorded and result sheet was prepared for analysis.

Analysis of Data

Keeping in view the objective of study and nature of data one way repeated measures analysis of variance was used to determine the mean achievement score during baseline, intervention and withdrawal phases.

Table 2

Means, Standard Deviations, and One-Way Repeated Measures ANOVA Statistics for Achievement Score

Achievement Score	M	SD	F ratio	df	η_p^2	Wilk's Lambda
Week 2	47.27	15.08	89.011***	8, 408	.636	.080
Week 4	49.46	14.20				

Week 6	48.58	14.34
Week 8	62.48	14.04
Week 10	65.17	15.18
Week 12	69.19	14.69
Week 14	54.23	15.19
Week 16	52.52	13.80
Week 18	50.10	13.56

*** $p < .001$

Table 2 shows difference of students achievement score at different data points. One way repeated measures ANOVA was used to see how a change in instructional strategy affected students in Grade XI's academic progress in the field of economics by making concept acquisition easier. Academic achievement mean score differed significantly across biweekly measurements taken over an 18 week period $F(8, 408) = 89.011$, $p = .000$, $\eta^2 = .636$. The post hoc Bonferroni test revealed that the achievement means of weeks 8, 10, 12, and 14 were substantially different from one another. Because there was a significant difference in achievement score throughout the three phases of the experiment, null hypotheses were rejected.

Discussion

This study was carried out to examine the effectiveness of concept attainment model of teaching for attainment of economics concepts at Grade XI level. Conventional method of teaching economics was used in baseline and withdrawal phases. While, concept attainment model of teaching was used in intervention phase. For this purpose, instruction was carried out for the period of 18 weeks. To evaluate the effectiveness null hypotheses were formulated and tested.

The method commonly used in public institutions to teach economics in Pakistan is conventional method. Same method is used to teach facts, principles and concepts. Method does not allow students to get deeper understanding of the idea and grasp the meaning of concept. Students often do not participate in classroom activities and are not prepared to explore the concepts themselves. Resultantly, students fail to get mastery of the subject and retain information for longer time. Sensitivity of the situation led researchers, educationists and curriculum developers to search for new methods of teaching and devise new techniques for teaching. Inductive teaching approaches and inquiry based methods are being recommended for teaching of various subjects.

Many studies have evaluated the effectiveness of concept attainment models for teaching diverse disciplines during the last two decades. The purpose of this research was to find a new way to teach economics at the college level in Pakistan. When students were taught using the concept attainment model of teaching, they did much well than when they were taught using the routine method. The findings are in line with previous research into the efficacy of a concept attainment approach for teaching economics (Bairagya et al., 2005; Habib, 2019; Praveen, 2018; Zacharia, 1989).

Experiment was carried out in three phases by altering the teaching method. When students received instruction according to phases of concept attainment strategy, they performed better as compared to conventional method. This research supports model of Joyce and Weil (1972), which suggests that the concept attainment model can be used to teach students of any age, grade, or subject.

Before experimentation, a pilot testing session was conducted to validate the practice of model. During the session, researcher observed the positive attitude developed for learning of economics concepts. Situation brings the confidence in application of model for the actual experiment. Similarly, students were found to be very excited during the trial when they were given instruction using the concept attainment technique. In the intervention phase, students were shown to be more engaged and responsive than in the baseline or withdrawal phases. Students were not told the name of the concept and they had to guess the concept themselves by identifying the attributes and setting the rule. Researcher noticed that students were enjoying exploring concept from examples and stating the rule. Moreover, students own the concept because they have been exploring the attributes and stated the definition. The situation is similar to one of educational psychology's principles, which states that people are most motivated when they have a clear understanding of what they are learning and how they will achieve it (Smith & Ragan, 2006). Students were not exposed to the textbook by the teacher; it was expected from learners that they will succeed in differentiating between examples, identifying the attributes and setting the rule. No textbook reading was used and no concept was introduced by teacher, rather students explored the concept and were able to express it in a language. Considering the economic and social background of students, most of the examples were selected from daily life and concepts were attained using examples from surrounding. This helped in easy and efficient concept attainment. Students were not only facilitated in attaining the concept rather they were also given the chance to relate concept to similar concepts but have different attributes, sub concepts and apply the conceptual knowledge in other situations. Attainment and assessment of any concept is successful if students are able to retain as well as apply the concept in other situation (Morrison et al., 2004).

The usage of ineffective teaching methods such as chalk and talk to teach economics topics prompted the researcher to conduct research (Allgood et al., 2015; Ullah & Iqbal, 2020; Umar et al., 2016). Consequently, students just remember the name of the concept along with definition without understanding for the sake of securing good achievement score in examination. Afterwards, students are unable to retain the concept and look hesitant when they are asked to describe the characteristics of even simple concept. The effective application of a concept attainment teaching model in economics classes, as well as increased achievement scores in the intervention phase, indicate that economics students may easily learn concepts provided teaching methods that are exciting and engaging to them.

Conclusion

It is concluded that concept attainment model of teaching helped students attain the concepts and improving the achievement level. It had positive effect on academic achievement of students. When students' mean achievement score was compared in three phases it was found that students gained higher achievement score in the intervention phase when concept attainment model was used to instruct. Further, it is concluded that concepts attained by students in the classroom conform to the real life situations. Hence, teachers of economics should try to make the learning environment conducive to learners and they should adopt new techniques of teaching and practice them in classroom.

Recommendations

It is proposed that more budgets should be provided to educational institutions to raise the quality of education and use of instructional material. Teachers should be trained to teach economics through concept attainment approach along with traditional teaching approaches. College teachers should be trained in use of dynamic teaching strategies through seminars, workshops and refresher courses. Teacher should be trained in use of inexpensive instructional material and new teaching methods to improve not only the achievement score but also the conceptual knowledge. The model can be used with limited resources and only with board and marker. Thus, government and training institution must provide training on Concept Attainment Model of teaching as model is practicable for concept teaching.

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