

Effect of Concept Attainment Model on Teaching Proficiency of Student Teachers (B. Ed. Students)

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Abstract: *The study aimed at finding the effect of the Concept Attainment Model on the teaching proficiency of student teachers (i.e. B. Ed. students). A sample of 50 student teachers of first year B. Ed was randomly selected. In this study, researcher has used pre-test post-test equivalent group design of experimental method. Descriptive and inferential statistics were used to compare the means between the groups. The finding of the study revealed that the concept attainment model has affirmative effect thereby improving the teaching proficiency of student teacher. Moreover, the concept attainment model, wherever and whenever applicable be adopted by the teachers during regular teaching so as to make the teaching-learning more effective.*

Keywords: Concept Attainment Model, Teaching proficiency, Student Teacher

1. Introduction

NEP 2020 emphasis to develop well-rounded, competent individuals with 21st-century skills. In this respect, the curricula and pedagogy have to be reoriented and revamped so as to achieve the targeted goals. As per the guidelines given in NEP, preparation of National Curriculum Framework (NCF-2023) for the foundation stage and secondary education is in progress, which aims at raising the standard of curricula and using appropriate pedagogy for effective delivery to the learners. The NEP 2020 is learner centric in its approach, and teachers play an important role in its implementation. For better learning outcomes, the policy offers more autonomy to teachers in respect of choice of pedagogy. There are different pedagogy/ approaches used by various teachers to up skill their teaching competency. Concept Attainment Model is one of the widely used approaches because of its unique advantages.

David Perkins's (1986) work on **Knowledge as Design** vs. **Knowledge as Information** connects to the thinking process involved in concept attainment. The author mentions that, when students are learning concepts, they should be able to respond to basic questions (what, why, when, where, and how). related to the design of that concept. This thrusts the idea of actively constructing knowledge rather than passively absorbing it. Bruce Joyce and Marsha Weil (1980) have described models of teaching as a plan/pattern that can be used to shape the curricula, to design instructional materials, and to guide instruction in the classroom and other settings. They have classified models into four families namely, (i) Information Processing Models, (ii) Personal Models, (iii).Social Interaction Models, and (iv) Behaviour Modification Models.

Concept Attainment Model (CAM) is included in the family of information processing models, which focus on intellectual capacity. The primary goals of CAM are (i) help individual to acquire knowledge through the analysis of data., (ii) help to develop general intellectual skills, and (iii) fostering the ability to think logically. The CAM is also known as the Inductive Thinking Model, It is a cognitive process that aims to help learners construct their own

understanding of abstract concepts by engaging in a structured inquiry-based approach. This model is particularly effective in promoting critical thinking, problem-solving, and deep comprehension. At its core, the CAM involves presenting learners with a set of examples and non-examples of a particular concept. Through a process of analysis, comparison, and reflection, students are encouraged to differentiate/distinguish the underlying characteristics that define the concept. This process is designed to be guided but not prescriptive, allowing for the exploration of multiple perspectives and interpretations.

One of the key strengths of the Concept Attainment Model is its emphasis on active engagement and discovery learning. By providing learners with concrete examples, it encourages them to explore patterns, make connections, and draw conclusions on their own. This not only nurtures a deeper understanding of the concept but also promotes a sense of ownership and confidence in individual's ability to learn independently. Furthermore, the CAM aligns well with constructivist theories of learning, which hypothesize that learners actively construct knowledge through their interactions with the environment and new information. By engaging in the process of perceptive defining characteristics, students do not merely memorize the information, but rather, they actively construct mental models that can be applied to new contexts.

Additionally, the CAM is versatile and can be used across various subject areas and grade levels. It can be used, in language arts to analyze literary kinds, and in social studies to examine historical periods, in science to investigate scientific principles, in mathematics to explore different geometric shapes, and other subjects at different levels. This versatility makes it a valuable tool/means for educators seeking to promote deep understanding and critical thinking skills across a wider domain of content areas.

Despite its unprecedented advantages, it is important to note that effective implementation of the Concept Attainment Model requires careful planning and thoughtful selection of examples and non-examples. The examples should be good representative and well-chosen to highlight the important

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characteristics of the concept. Additionally, the process should be framed to provide appropriate levels of support and guidance based on the learners' prior knowledge and aptitudes. In nutshell, the CAM is a powerful instructional strategy that promotes active learning, critical thinking, and deep conceptual understanding. By engaging learners in a organized process of inquiry and discovery, it allows them to construct their own knowledge and develop a sense of action in their learning journey. With its broader adaptability and effectiveness, the CAM has been recognized as a valuable tool in the educator's toolkit for promoting meaningful learning experiences.

Teaching proficiency means the knowledge, skills, abilities and attitudes which teachers need to have in order to promote learning processes and design lessons (Reinmann, 2011). It refers to a combination of expert and instructive knowledge, practical teaching experience, skills that have been learn and practiced, insights and attitudes, above all with respect to interaction with students and the teacher's own role. The decisive factors are teachers attitudes towards teaching, the bearing he/she adopts towards students, and their willingness to familiarize lessons to the conditions, abilities and expectations of the students. Hattie has described the teaching proficiency as "It is the teachers who are open to experience, learn from errors, seek and learn from feedback from students and who foster effort, clarity and engagement in learning" (Hattie, 2009). This requires a inclination and ability to reflect time on one's approach to teaching and is not simply knowledge that can be learn. It evolves as teachers consciously design their lessons to the needs of the students and their specific characters, and then observe carefully how their students respond. The teacher should communicate with the students and accordingly modify their lessons to the learner's needs and learning progress.

2. Literature Review

Thomas (2005) et. al. have conducted a study on the effectiveness of concept attainment model and test book method in Chemistry at Higher Secondary level. The study was conducted on a sample of 110 students of standard XI of three divisions in Govt. Higher Secondary School, Karapusha, Kottayam. The author has used experimental method. The study concluded that teaching through the concept attainment model is more effective for the achievement in chemistry, as compared to the textbook method. Verma (2001) reported that the concept attainment model improves the inductive reasoning ability of the students. Vyas (2014) reported that effect of concept attainment model of instruction was significantly higher on the over, normal and under achiever students. Researches conducted on concept attainment model reveals that student achievement is noticeably improved, when taught through this model. Most of the studies are addressed to the effect of CAM on achievement of students in mathematics, science, and other school subjects. However, from the literature review it is observed that, no study is hitherto performed on student teachers (B. Ed. students). In this study, an attempt is made to reveal the effect of CAM on the teaching of student teacher.MR. Mahesh Patel (2014)reported effect of Concept Attainment Model of teaching on achievement in Chemistry

at higher secondary stage. A sample of 100 students was selected at random. 50 students were selected randomly to form an experimental group. Another 50 students were selected randomly to form the control group for the study. The experimental group was given the Concept Attainment Model of teaching and the control group was taught through the Conventional Method (Lecture Method) of teaching. The data was collected and analyzed with the help of suitable statistical techniques. Concept Attainment Model was found to be effective in terms of achievement of students in Chemistry.

A Halimand other reported Effect of concept attainment model on student's science process skills , The type of research used is experimental research with pre-experimental methods and one group pre-test post-test design. The research sample was selected for grade I at Peukan Bada Senior High School. Data collection used non-test instruments in the form of observation sheets to see students' science process skills. The results of data analysis using the percentage formula showed an increase in science process skills from the first meeting to the third meeting. At the first meeting, the average percentage was 54.66%, which was categorized as sufficient, at the second meeting it was 76.66% which was categorized as good, while at the third meeting it was 84.47% which was categorized as very good. The indicators of science process skills with the highest improvement were observation, interpretation, prediction, and concept application. Meanwhile, the lowest indicators are classification, experimental design, and communication.

Objectives:

- 1) To identify knowledge of student teachers about teaching proficiency.
- 2) To develop an intervention programme based on Concept Attainment Model with attributes of teaching proficiency in science.
- 3) To reveal the effect of intervention programme on the teaching proficiency of student teachers.

Hypothesis:

H1: There is significant difference in achievement of the students of experimental and control group.

H0: There is no significant difference in achievement of the students of experimental and control group.

Sample:

The study was carried out on a purposive sample of 50 student teachers (having science as one of the methods) from two intact B.Ed. classes of Dnyanganga college of Education Pune.

3. Methodology

In the present study, pre-test, post-test equivalent group design of experimental method was used. The researcher has used achievement test to check the teaching proficiency of student teachers, as well as for equivalence of the experimental and control groups. An intervention programme based on Concept Attainment Model with attributes of teaching proficiency in science was designed and then implemented on the experimental group in two weeks. The researcher has requested her colleagues to

observe lessons of student teaches of experimental and control groups before and after implementing intervention programme, thereby noting major changes in their teaching. To assess the effect of intervention programme, a questionnaire comprised of 25 objective and 10 open ended questions, revealing the teaching proficiency in science, was prepared. After completion of the intervention programme, the questionnaire was distributed to student teachers of both the experimental and control groups.

The data collected through questionnaire was analyzed using SPSS (Statistical Package for the Social Sciences, IBM, free

version), whereas the answers to the open ended questions were qualitatively analyzed by the researcher.

4. Data Analysis

Descriptive Statistical Analysis referring to Group Equalization:

Descriptive statistics (Mean, Standard Deviations) were used to compare groups on the basis of scores of pre-test and post-test. Inferential statistics ‘t’ test was applied to compare the mean post-test scores of experimental and control groups to determine the effect of concept attainment model on teaching competencies in science.

Table I: Statistical analysis for Group Equivalence

	No. of students	Mean	S. D.	r	Df	t value	Level of Significance
Experimental Group	25	18.28	1.8601	0.5098	24	0.2794	0.01
Control Group	25	17.76	1.4798				

Table-t value of 1.711 at the significance level of 0.01 whereas the obtained t-value is 0.2794 for the degrees of freedom (Df) of 24 seen from above Table-1. The obtained t value is less than table t value, it means that both the

selected groups are equivalent with respect to teaching proficiency of student teachers, before applying the intervention programme.

Table 2: Paired Samples Test

		Paired Differences				Df	t	Sigma (2-tailed)	
		Mean	S. D.	Std. Error Mean	99% Confidence Interval of the Difference				
					Lower				Upper
Pair	Experimental and Control Group	3.0400	1.8366	0.3673	2.0125	4.0674	24	8.276	.000

Above table shows gain score mean in post-test of achievement in teaching proficiency. The obtained t value 8.276 for achievement in teaching proficiency of the student teacher is greater than the table t value 1.711 at 0.01 level of significance hence gain score of the experimental group is significantly more than that of control group. Hence null hypothesis was rejected. This confirms that due to the intervention programme based on CAM there is increase in gain score of the experimental group.

Qualitative analysis of responses to open ended questions and observation of lessons:

Addressing the question, “How concept attainment is useful to you as a teacher?”, most of the students replied that due to intervention programme based on CAM, they have gained more clarity in respect of concept understanding, identification of concept, importance of identification of goals, how to be identify attributes of concept, and collecting appropriate learning experiences. Involving students in teaching learning process, mentoring the students to reach upto concept/answer. It also helped in improving concept building strategy, developing inductive thinking in the students, sensitivity in logical reasoning in communication, awareness, tolerance of ambiguity, of alternative perspective, examples for teaching. Using the concept attainment model based intervention programmes, teachers can help students develop better language acquisition skills while also teaching them how to classify items, build vocabulary, and recognize relationships. These models also encourage active participation in the learning process which further enhances the learning experience.

Findings of the study:

Near about 90% of the student teachers of experimental group agreed that the intervention programme based on CAM was very helpful in enhancing their teaching proficiency. Similar remark was made by the colleagues, who had observed the lessons of student teachers of both the groups. The observers mentioned that the experimental group student teachers were comparatively better than the control group members in respect of understanding and delivery of the content. By citing a set of examples and asking the learners to analyze, they made teaching-learning interactive and more effective. Thus, the study clearly reveals that teachers should use the Concept Attainment Model in teaching, wherever and whenever is applicable, so as to improve teaching proficiency. This approach can enhance teaching proficiency in several ways:

- 1) Unambiguous understanding of concepts: It allows teachers to present clear and concise examples of concepts, making it easier for students to grasp and internalize the information.
- 2) Active engagement: It encourages active participation from students as they analyze and compare examples and non-examples, developing a deeper level of engagement with the material.
- 3) Rational thinking: This approach promotes critical thinking skills by requiring students to distinguish patterns and characteristics that define a concept.
- 4) Tailored learning: It enables teachers to alter examples to suit the specific requirements and learning styles of the students, encouraging personalized learning experience.

- 5) Improved retention: By explaining the concepts in a organized and complementary manner, this approach helps in memory retention and long-term understanding.
- 6) Investigative tool: It allows teachers to identify any misconceptions or gaps in the understanding among their students, enabling them to address these issues promptly.
- 7) Adaptability: This model can be applied across various subjects and topics, making it a versatile tool for teaching a wide range of content.
- 8) Encourages inquiry-based learning: It raises a sense of curiosity and inquiry as students actively participate in the process of identifying and understanding concepts.
- 9) Facilitates constructivist learning: The model aligns with constructivist principles, where students actively construct their own understanding of concepts through exploration and reflection.

5. Conclusion

The quantitative and qualitative analysis revealed that intervention programme based on Concept Attainment Model has affirmative effect on the teaching proficiency of student teachers (B. Ed. students). This approach provides scope to the student teacher to design lesson and willingness to adapt lessons according to the conditions, abilities, and expectations of the students. This study stipulates importance of the concept learning, clarity, and engagement in learning of science education and advocates its use by the school teacher.

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