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Effect of Autonomous Learner Approach on Prospective Teachers' Critical Thinking Skills

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Abstract: *Autonomous learner approach facilitates the learning environment in which students become a responsible and self-directed learner. The purpose of this experimental study was to explore the effect of the autonomous learner approach on prospective teachers' critical thinking skills. The 'quasi-experimental pre-test post-test control group research design' was used for this study. The participants of this study were prospective teachers of M.A. Early Childhood Education, studying at the Institute of Education and Research, University of the Punjab, Lahore'. A self-developed critical thinking skills scale (CTSS) was used for collecting the data. Independent samples t-test and ANCOVA were used to analyse the data. Findings show that there was an effect of the autonomous learner approach on prospective teachers' self-directed learning skills. The conclusion demonstrates that the autonomous learner approach is requisite in developing critical thinking skills among prospective teachers.*

Key Words: Autonomous Learner Approach, Prospective Teachers, Critical Thinking Skills

Introduction

Autonomous learner approach is associated with active learning. The concept of the autonomous learner approach can be inserted in the teacher training curriculum for improving prospective teachers' critical thinking skills. This approach allowed learners to become free agents in their own learning. Prospective teachers' studying in an autonomous learner environment are facilitated to set their own goals for learning through the strategies to be used for learning, taking actions to achieve the goals, monitoring and evaluating the results of their work (Nakata, 2014). It will empower learners to be more engaged in learning and transfer the responsibility from the teacher to the learner (Reinders & Lazaro, 2011). They feel learning is more enjoyable and become more successful critical thinkers.

The teacher's job in the autonomous learner approach is to facilitate, provide, help, and support students in their learning. They assist students with their educational requirements and help them on how to improve their critical thinking skills along with the more specialized "applications of theory, methods, and techniques" that are required for the subject (Browne & Keeley, 2018). Critical thinking competence is the means to come as close to the truth as feasible. Fisher (2011) proposed that critical thinking is a talent in which learners ask and answer questions in a systematic manner rather than accepting what is said or received. Critical thinkers questioned the whys and wherefores before accepting anything as true.

The autonomous learner approach helps students become more responsible and efficient in their learning. It develops a deep level of thinking that generates critical thinking skills such as "evaluation, selection, prediction, abstraction, fostering justified selections, deductions, and generalisations" (Liu & Wang 2010; Kules 2016; Sonmez, E., Memis, E. K. & Yerlikaya, Z. 2019)". Effective learning requires the ability to think critically. According to Villavicencio (2011) "critical thinking is the ability through which the

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learner ask questions, generates responses frame them clearly and then makes judgments".

Soyhan (2015) defines in an environment where learners may set their own learning goals, numerous questions arise in their minds, prompting them to create explanations based on existing ideas and develop 'critical thinking skills'. Critical thinking skills play a significant role in acquiring creative knowledge. Autonomous learner approach develops critical thinking skills under the guidance of the teacher as facilitator (yan, 2012). Critical thinking is an essential component of the educational process; it is necessary to be educated; therefore, learners deserve to be trained how to reflect critically (McPeck, 2016). Autonomous learners can self-regulate their learning objectives and think critically in order to make rational decisions. It will allow students to evaluate their own judgments objectively, reducing their dependence on the teacher. The findings show that using an autonomous learner approach helps students improve critical thinking skills.

Critical thinking has been defined as logical thought reflected in actions and choices or as skilled thought that enables sound judgments. Such efforts to characterize the concept have aided in the understanding of critical thinking as more than a collection of acquired abilities but also as something that requires a set of associated actions. Critical thinking is the capacity to examine, critique, and argue for ideas, to reason both inductively and deductively, and to reach factual or judgmental judgments based on good inferences and reasoning (Can & Kaymakci, 2015).

Critical thinking entails the retrieval and production of accurate knowledge about a recognized problem, followed by the application of that information to arrive at workable solutions (Fisher, 2011). The reason for this is because, once we acquire particular modes of perception, they get ingrained in us: we think that what we perceive is the world as it is, not as we see it. We all take our methods of viewing the world for granted, and we perceive it differently from one another, most of the time without realizing it. This is arguably the university's most perplexing problem when it comes to creating information that is novel for individuals through teaching and studying or knowledge that is novel in the abstract through research (Cherubini, 2009).

Knowledge is always predicated on certain ways of seeing the world, most of which we are unaware of; therefore, when teachers, students or researchers with relatively disparate specialities do not communicate their differing perspectives, a vital and often invisible problem occurs. Critical thinking is necessary not just for academic performance but also for lifetime learning (Sezer, 2008). As a result, a large number of schools and institutions have included critical thinking frameworks, concepts, and teaching methods into their general education curricula, especially in prospective teachers curricula (Sonmez, Memis & Yerlikaya, 2019; Peach, Mukherjee, & Hornyak, 2007). As a result, it's unsurprising that words such as reflective thinking, analytic thinking, logical thinking, problem-solving, creative thinking, and critical thinking are often employed in program descriptions and course goals.

Nosich (2012) defines critical thinking skills involve three steps: asking questions, answer those questions by reasoning and provide the logical arguments for reasoning. The process of successful critical thinking is to have good reasons to believe in what we believe or to prevent from believing with what we do not agree. Brookfield (2008) defines critical thinking skills as identify the assumptions, analyse the information and evaluate the results of reasoning. He claims that critical thinking is a dynamic, continuous and social learning process. Paul and Elder (2006) explains that critical thinkers must be the focus on "the aspects of thinking such as identify assumptions, evidence, conclusions, implications and consequences".

Several studies emphasized the importance of developing critical thinking skills in university students. Chinese study highlighted the significance of developing critical thinking skills in graduates (He, Craig, & Wen, 2013). Barnett (2015) defines that "to develop critical thinking skills in students there is need for teachers to be critical thinkers". Jones (2015) define that critical thinking skills become the focus of education and are used in a teacher training program. They also emphasized the importance of critical thinking skills in higher education. It is emphasized in many studies that prospective teachers should have the knowledge of critical thinking, and they know how critical thinking skills can be developed in students. The development of critical thinking skills at the university level was highlighted by

several researchers ([Barnett, 2015](#); [Jones, 2015](#); [Moore, 2013](#); [Nosich, 2012](#), [Moon, 2008](#)).

[Halpern (2014)](#) defines that a successful educator as one who can develop critical thinking skills in students so they can analyse and evaluate the information and prove it with logical reasoning. [Brookfield (2012)](#) defines that peer collaboration or working in small groups enriches the development process of critical thinking skills, and students' involvement in the process is vital for learning critical thinking skills. [Mulnix (2012)](#) define the role of a teacher as a 'facilitator' in class who supports through open-ended questions. Students learn critically through discussion in the classroom. Students can learn critical thinking skills better when they are actively involved in the learning process ([David & Brown, 2012](#)).

An autonomous learner approach that is free of any instructional constraints and preferences develops critical thinking skills in learners, and they have the right to challenge what they are taught. Therefore, establish autonomous learner environment in classrooms is a prerequisite for teachers in order to encourage learners to develop critical thinking skills ([Soyhan, 2015](#)). Teachers are accountable for creating a positive classroom atmosphere in which students are motivated to have the charge of their learning. [McKernan (2008)](#) stated that "education should be open-ended, providing autonomous learner environment to the students in which they comfortably develop their critical thinking skills". Teachers facilitate the learning process by guiding students to become more responsible, and as a result, students will be encouraged to think critically about problems ([Yan, 2012](#)). Learners ask questions about the problems, analyse the scenarios, and interpret their conclusions based on their findings. Teachers' play the role of a facilitator in the learning process, and they guide learners to become more responsible. Hence students will be encouraged to think critically about the issues. Research shows that the autonomous learner approach develops critical thinking skills in learners. Researcher framed the following objective of this study:

1. To investigate the effect of autonomous learner approach on prospective teachers critical thinking skills.

The null hypothesis of this study was as follows:

H$_{01}$: There is no statistically "significant difference between pre-test scores of experimental and control groups".

H$_{02}$: There is no statistically "significant difference between post-test scores of experimental and control groups".

H$_{03}$: There is no effect of "intervention on critical thinking skills post-test scores of the experimental group".

Methodology

Quasi-experimental research design was used for this study. The "pre-test post-test control group design is a quasi-research design in which participants have not been randomly assigned" ([Gay, 2000](#)), A as experimental group and B as control group were selected for this study. The experimental and control group were measured at "pre-test and post-test, but only the experimental group" received the intervention. The advantage of this design is to determine exactly how different the experimental and control groups are prior to intervention ([Creswell, 2012](#)). Researcher teaches the group A by using the autonomous learner approach. Researcher conducts the pre-test from both groups A and B. An intervention is delivered in 16 weeks comprising of 32 lessons to Group A. Control group B was taught by conventional teaching.

The researcher, after the completion of the intervention, conducted the post-test from group A and, without intervention, conducted the post-test from group B for data collection based on the prospective teachers' self-directed learning skills scale, which consists of statements from the indicators of critical thinking skills. Master of Arts in Early Childhood Education first semester (2020-2022) prospective teachers' from the Institute of Education and Research were selected through convenience sampling technique. There are 32 participants in experimental group A and 32 participants in control group B.

The critical thinking skills scale (CTSS) was developed by the researcher for prospective teachers through reviewing the related literature ([Acar, Kara & Ekici, 2015](#)). Statements for the scale were consisted on the indicators of critical thinking skill. The trustworthiness of a research lies at the validity and reliability of the instrument. The validity and reliability are the most important characteristic for measuring the instrument quality (Cohen, Manion & Morrison, 2018). The

reliability of the instrument was evaluated by pilot testing. Pre-test were conducted from the participants of M.A. 1st semester from different disciplines for pilot testing. The results of the test confirm the reliability of the instrument. The content and face validity of the research instrument was assessed by three educationists and two peers' review. The overall expert opinion helped the researcher in developing valid instrument. The critical thinking skills scale (CTSS) was changed in the light of experts' judgment.

Data Analysis

Independent samples t-test and One-way Analysis of Covariance (ANCOVA) were applied to determine the statistically significant difference between the data of pre-test and post-test. "ANCOVA is used when researcher has two-group pre-test and post-test design" and participants were unable to randomly assign ([Pallant, 2010](#)). In this study intact groups were used for experimental procedure therefore researcher was unable to randomly assign the participants therefore ANCOVA was used to reduce the statistical differences between groups. This procedure is another mean for statistically equating the two different groups ([Creswell, 2012](#)). On the basis of data analyses following findings were obtained:

H_{01}: "There is no statistically significant difference between pre-test scores of experimental and control groups".

Table 1. "Pre-test Scores of Experimental and Control groups on Critical Thinking Skills"

Skill	Experimental Group		Control Group		Independent samples t-test		Effect size
	Mean	SD	Mean	SD	t	p	Cohens'd
Critical Thinking skills	21.50	3.98	22.06	5.33	-0.48	0.634	0.12

Table 1 shows comparison of "pre-test scores of experimental and control groups on critical thinking skills". Independent samples t-test was conducted to pre-test scores of experimental and control groups on critical thinking. "There was no statistically significant difference in the pre-test mean scores of experimental and control groups on critical thinking skills". It was (p=0.634). The effect size on the basis of pre-test scores of experimental and control groups on critical thinking skill was low (d=0.12). Hypothesis one was accepted.

H_{02}: "There is no statistically significant difference between post-test scores of experimental and control groups".

Table 2. "Post-test Scores of Experimental and Control groups Critical Thinking Skill"

Skill	Experimental Group		Control Group		Independent samples t-test		
	Mean	SD	Mean	SD	T	p	Cohen's d
Critical Thinking Skill	40.03	3.43	23.72	5.03	15.15	<.001***	3.86

***p<.001

Table 2 shows comparison of "post-test scores of experimental and control groups on critical thinking skills". An "independent sample t-test was conducted to post-test scores of experimental and control groups on critical thinking". There was statistically significant difference in mean scores of "post-test scores of experimental and control groups on critical thinking skills" (p<.001). The mean score (Mean=40.03, SD=3.43) of 'post-test scores of experimental group was higher' than mean score (Mean=23.72, SD=5.03) of control groups on critical thinking skills. The effect size on the basis of "post-test scores of experimental and control groups on critical thinking skills was high" (p= < .001, d=3.86). Hypothesis two was rejected.

H_{03}: "There is no effect of intervention on post-test scores of experimental groups on critical thinking skills".

Table 3. Summary of ANCOVA: "Effect of intervention on Post-test Scores of Critical Thinking Skills"

Source	Type III SS	df	MSS	F	p.	Partial η^2
Post-test scores on Critical Thinking	339	1	339	25.53	<.001	.295
Group (Experimental, Control)	4388	1	4388.6	330.3	<.001	.844
Error	810	61	13.28			
Total	70432	64				

Table 3 shows effect of intervention on "post-test scores of critical thinking skills'. ANCOVA technique was applied to find effect of intervention on "post-test score of experimental and control groups on critical thinking skills". There was significant effect of intervention on post-test score of experimental groups on critical thinking skills after eliminating effect of pre-test scores of critical skills (P<.001). Hypothesis three was rejected.

Discussion and Conclusion

The results showed that "there was no significant difference in the pre-test mean scores of the experimental and control groups" regarding critical thinking skills. Independent samples t-test was applied to measure the pre-test scores of experimental and control groups on critical thinking skills was (p=0.634). The effect size on the basis of "pre-test scores of experimental and control groups on critical thinking skill was low" (d=0.12). There was "statistically significant difference in mean scores of post-test scores of experimental and control groups" regarding critical thinking skill was (p<.001). The mean score (Mean=40.03, SD=3.43) of post-test scores of experimental groups was higher than mean score (Mean=23.72, SD=5.03) of control group on critical thinking skills. Table 1.3 shows "effect of intervention on post-test scores" of critical thinking skills. ANCOVA technique was applied to find "effect of intervention on post-test scores" regarding critical thinking skills. There was "statistically significant effect of intervention on post-test scores" regarding critical thinking skills after eliminating effect of pre-test scores regarding critical thinking skills (P<.001).

Can and Kaymakci (2015) define interventions focused on autonomous learner environment help early childhood prospective teachers' to improve their critical thinking skills. Several studies used different intervention approaches to develop critical thinking skills in prospective teachers.

Critical thinking skills are essential in many academic fields, but they are especially significant in teacher education (Villavicencio, 2011; Mazer, Hunt & Kuzuekoff, 2008; Peach, Mukherjee & Hornyak, 2007). Furthermore, it is essential that through teacher education program prospective teachers should be trained to become critical thinkers (Lyutykh, 2009), teachers can successfully encourage their students' critical thinking abilities, thus effectively improving society's critical thinking skills (Sezer, 2008; Cherubini, 2009).

The present study indicates that during intervention in an autonomous learner environment, prospective teachers' develop or improve the critical thinking skills (Nakata, 2011; Reinders & Lazaro, 2011; Cardenas, 2012). Critical thinking skills are required for both classroom and lifetime learning. It turns the learners into an active participant rather than passive one. The development of critical thinking skills is the utmost important element of teacher education program (Fisher, 2011). Prospective teachers ask questions and make assumptions in an autonomous learning environment rather than taking material as it is, and as a outcome, they develop their critical thinking skills. It is concluded that if learners have the autonomous learner approach to establish their own learning objectives, they can develop critical thinking skills (Azizi, Sedaghat & Moghadam, 2018; Browne & Keeley, 2018; Yasmin & Sohail, 2017; Paul & Elder, 2010; Nosich, 2009). A critical thinking skill is essential for classroom and lifelong learning.

Recommendations

1. HEC encourages learner autonomous approach in higher education as being part of curriculum or pedagogy in teacher training institutes.
2. Teacher training institutions need the relationship between theory and practice.
3. Motivate teachers to play role as a facilitator.

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