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## Effect of Critical Thinking on Reading Skills of Student Teachers at University Level

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### **Abstract**

The current study investigated the effectiveness of critical thinking teaching intervention on developing the receptive and productive skills of the students studying at university level. Both kind of skills are highly valued and expected from the students at university level. The receptive skills refer to listening and reading while productive skills are speaking and writing. The main objectives of the study was to find effect of 'critical thinking' as an intervention on receptive skills as well as on productive skills of students at university level. As well, it was to compare their performance before and after critical thinking intervention. Similarly, experiences with respect to critical thinking were also targeted to be found out. The study used quasi-experimental design due to its suitability in the given circumstances. The population of the study comprised of students from BEd (Hons) program. Due to small size, all the students of BEd (Hons) studying in second semester were taken as sample using total population sampling technique. A critical thinking model was adopted for the intervention purpose in the subject of Communication Skills in BEd program of education department in university of Haripur. The intervention continued for the period of eight weeks. The receptive (reading) and productive (writing) were measured through standardized pretest and posttest. As follow-up, to describe students' experiences, motivated learning strategies questionnaire (MLSQ) and critical thinking questionnaire (CTQ) were used to strengthen the results obtained from the intervention. The data were analyzed through 't-test', 'mean score', 'standard deviation' and 'percentages'. The results of the study showed better performance in reading and writing skills of the students at university level. It was recommended to train teachers in areas relevant to critical thinking in order to make them better teach their students in terms of critical thinking. Further researches should be carried out in different disciplines.

**Keywords:** critical thinking, university students, receptive skills, productive skills

### **1 INTRODUCTION**

Knowledge is power beyond the shadow of a doubt; education provides that power which plays a vital and significant role in the development of a nation in all respects. Primarily, being humans, thinking is the main source to unlock the secrets of knowledge where education paves way to the treasures of knowledge. Poor quality of teachers' professional development, on the other hand, has been taken into account by National Professional Standards for Teachers (NPST, 2009) and National Education Policy (NEP, 2009), as acknowledge clearly, along with communication gaps, instructional planning and strategies and call for reforming curriculum for better quality education at university level in Pakistan.

The students need to be equipped with skills demanded by the 21<sup>st</sup> century. Within the skill, critical thinking is one of desired outcome of education (Bell, 2010). Learners at tertiary education, are particularly expected to develop critical thinking skills in order to cope with the challenges of the modern world. The education systems across the globe have realized

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significance to nourish critical thinking of students. A bulk of research has already been done on critical thinking which proves its role in better academic performance leading to better professional development later in life.

There has been lesser number of research studies attempting to understand whether the teaching critical thinking really improves the academic improvement of the students. Hence, there is need of continued research about the use of considerable critical thinking interventions. Interventions of critical thinking are to be well-designed educational opportunities to enable teachers to improve the academic performance of their students (Karbalaeei, 2012).

In Pakistan, the area of critical thinking in terms of research is still immature and needs further attention. The government national education policies highlighted critical thinking as the core outcome of the whole educational endeavor. The critical thinking should be explored deeply in Pakistan particularly at higher education level (Mahmood, 2017). All this has driven the researcher to conduct a research study on developing critical thinking through an intervention in reading and writing skills of the student teachers.

## **II REVIEW OF RELATED LITERATURE**

Activity of the mind, surely as it has been understood and has rarely been observed directly. Thinking is based on previous exposures, and surely it leads to novice discoveries. Baddeley and Anderson (2000) discovered facts about this, thinking occurs in working or functional memory, and that restricted ability might be a regulating element, according to Johnstone (1997). A variety of mind related act of functioning, will be involved in thinking. These procedures are referred to as thinking skills by Griffen (2001), whereas learned abilities or capacities are referred to by Smith (2002). Several scholars, however, have emphasised, according to Coles and Robinson (1991) as well as, Johnson and Gardner (1999), problems related to readiness, which is a topic that Al-Osaimi et al. have also emphasised (2014).

Questioning entails asking someone or something a question. This immediately puts nourishing of skills of critical thinking as learning in the form of teamwork. Similarly, learning is also result of interacting with others in social contexts. Peer learning is used in social context. Students ask questions from each other. They also challenge each other and ask questions which may compel them to think. Students share ideas and questions in peer learning directed at what is being presented to them in order to build their questioning skills. Various researchers have built on Vygotsky's results to include areas of learning through social interaction.

As previously stated, critical thinking was shown this study as a set of skills that involve productive questioning. These questions include but not limited to evaluation and judgement. The weight of argument is questioned and evidence quality is judged. Claims made by authors are evaluated while the source reliability is assured. Questions are asked regarding interpreting the material. This raises question of how to encourage critical thinking. It is plausible to say that for the sake of developing capacity to examine as well as to evaluate knowledge, students should involve in circumstances which allow for to ask questions. In learning contexts, 'to pose questions' is heavily influenced by social interactions. This could include academic contexts where a student has a mentor or facilitator, who could be someone who teaches or a fellow student.

Manan and Mehmood (2015) highlighted educational system in Pakistan as governed by rooted in depth, social as well as cultural norms of reserved kind, discourage questioning and emphasise compliance. Progress necessitates the abolition of tradition's dead hand, breaking the absolute dictatorship of the teacher, a relic of pre-modern social values, will be critical in achieving value transformation'.

What we can deduce from the limited research on critical thinking conducted in Pakistan is that there is scarcity of clarity about looking at the concept of critical thinking. Most of researcher agree asking questions as critical to critical thinking. Questioning should be within that particular frame of reference i.e., the topic being taught to students which means relevant questions need to be asked. Another significant topic is how to improve critical thinking skills. The research mentioned above provide very little in this regard, although they do highlight some of the more significant areas of impediment. It will look at the factors that may help or impede the development of critical thinking abilities in Pakistan, as well as struggle to define critical thinking in the matter of putting right questions.

An important goal of higher education is for graduates to be competent critical thinkers when they leave university. In most cases, the curriculum is not constructed in such a way that it promotes students to develop critical thinking skills in the classroom. As a result, curriculum objectives are usually stated that mostly reflect the content students have to cover, while evaluation techniques to a greater extent credit just correct memory (Ud Din, et al., 2012). However, as university courses become more modular, there is a lot more room for evaluation to grade many other talents students need to have (HEC, 2013). Teaching faculty in universities have not received proper training in order to exhibit a high quality critical thinking skills which they are supposed to teach their students. Such teacher training programs were scarce. As a result, most of the teachers at university level do not possess teaching methodologies that may enhance students' critical thinking competence. It is reason that most of the teachers at university level are left with a hazy understanding of what is required and little practical instructions on how to implement instructional practises that will promote critical thinking development.

The educational circles have realized the significance of CT in coping with challenges of the current global scenario. Critical thinking is at the heart of a number of educational initiatives aimed at improving cognitive abilities and curricula. There have been several defining notions to clarify concept of critical thinking presented. At the same time, experts from the field of education and psychology, showed concern or interest in learning more about domain of cognition in human mind, and finding the cognitive abilities that can be used while thinking. Bloom is credited with being the first to identify the nature of cognitive talents in 1956.

If students are to acquire desired outcomes in a reasonable amount of time, the teacher's primary duty is to get them to participate in learning activities that are likely to lead to those objectives being achieved. (Shuell, 1986) The ability to engage in critical thought, as shown by Shuell's statement above, is fundamental to education (Lucas & Tan, 2013). Learning, according to Shuell (1986), is defined as a long-term change in one's capacity or behaviour to accomplish something as a result of an experience or practise.

Unfortunately, these studies have concentrated mostly in developed countries, leaving much in developing countries. Scientific studies are needed to specifically, concentrate in context

of developing countries and particularly looking into the two sides, teaching and learning. Furthermore, most of studies and their population concentrated more in different institutions, hence study which concentrate in higher education level is also needed. This study intends to investigate student teachers' perception as well as effect on reading and writing due to an intervention of critical thinking at university level.

Reading and writing have been researched widely but when it comes to, for instance, Functional English, particularly in the context of BEd (honours) programs, almost nothing has been written on such courses in Pakistani higher education. The studies look at the nature of critical thinking and its importance in higher education in Pakistan, with a focus on teacher education. These studies, on the other hand, emphasise the relevance of critical thinking development at the university level in particular, and suggest ways in which critical thinking could be promoted in these courses (Saeed et al., 2012; Cassum et al., 2013; Manan and Mehmood, 2015).

### **III STATING THE STUDY PROBLEM**

One of the major desired outcomes for education is to develop students in terms of critical thinking. The current study revolves around developing critical thinking of the learners in BEd (Hons) through an instructional intervention on students' performance in receptive and productive skills at university level in the subject of communication skills.

#### **a. Objectives**

The current study has the following objectives:

- i. To analyze the effect of critical thinking intervention on the reading skills (reading) of the students in BEd (hons) program in university before the administration of the intervention
- ii. To analyze the effect of critical thinking intervention on the receptive skills (reading) of the students in BEd (hons) program in university after the administration of the intervention
- iii. To find the difference in between the performance of students in receptive skills (reading) before and after the intervention

#### **b. Research Questions**

The given below, were the questions of research designed for the current study.

- i. How does a carefully designed critical thinking instructional intervention n affect the receptive skills (reading) of the students in BEd (hons) program in university before the administration of the intervention?
- ii. How does a carefully designed critical thinking instructional intervention affect the receptive skills (reading) of the students in BEd (hons) program in university after the administration of the intervention?
- iii. What is difference in the performance of the students in receptive skills (reading) before and after the intervention?

#### **c. Hypothesis**

The follo wing were the research hypothe ses of this study.

- i. There is no significant difference of achievement in between the performance of the

students with respect to reading before and after the critical thinking intervention.

#### **IV METHODOLOGY**

The research methodology applied was quantitative. The main purpose of the current research is to find the effect of critical thinking intervention on reading skills of students studying at university level.

The main study question is to seek better understanding of critical thinking intervention to students in relation to its effect on critical thinking of the students in receptive skills of 'reading'. The answers to these questions could better be found by observing the intervention itself through experience of participants; here in this case the students at university level. Hence, on one side, the study seeks to test the effectiveness of critical thinking intervention while on the other side, seeks to interpret the phenomena for better understanding.

The current research has an independent variable of critical thinking intervention, and dependent variables of reading and writing skills. The details of the framework in the form of a diagram has been given.

The study applied quasi-experimental research design in order to find the effect of critical thinking on reading and writing skills of students at tertiary level. Reasons of selecting this design are pre-existing factors in group settings. These constraints are beyond capacity of the researcher to control. The quasi-experimental design is applied in situations where methods and procedures for observing phenomenon are structured the way experimental design is conducted, but there is lack of control due to some extraneous variables. Besides, it does not have a control group.

All students who are enrolled in BEd (Hons) program offered in all public sector universities, was the target population of this study. Within the target population to which results are generalized, the accessible population was the students of BEd (Hons) in University of Haripur, KP, Pakistan.

There were currently 45 students enrolled in BEd (Hons) program in university of Haripur. Of this total, 27 students were promoted to the second semester who study 'communication skills'. The actual population of this study was 27 students enrolled in second semester, Spring 2020 of BEd (Hons).

Sampling technique used in the study was total population sampling (a type of purposive sampling technique). The accessible population comprised of 27 students studying in second semester of BEd (Hons), all of them were selected as sample using total population sampling technique (Ashley, 2018).

#### **V RESEARCH INSTRUMENT**

The research study used reading achievement test before and after the intervention of critical thinking.

##### **a. Achievement Test in Reading Skills**

An achievement test in reading skills was developed and applied to the students performance

##### **b. Treatment**

The data were collected from students by researcher himself. The necessary permission was

obtained first from the concerned authorities in the department of education, International Islamic University Islamabad, followed by permission from head and teachers of the education departments in university. The data were collected through standardized tests of 'reading and writing' in the form of pretest and post-test.

The data were analysed through SPSS via statistical tools of 't-test', 'mean score', 'standard deviation', 'frequencies' and 'percentages'.

## VI RESULTS AND DISCUSSION

Table 4.1: *Experimental group, Pre-test mean (Group statistics) Reading test*

	Subject	N	Mean	Std. Deviation
pre-test score	Experimental	27	6.94	2.6

Table 4.1 indicates the basic knowledge of reading test. The mean pre-test score of 27 students was 6.94 and the marks deviated with the mean score of 2.6. There was only experimental group to test the reading skill of critical thinking. So it is interpreted that the students have very low ability of critical thinking.

The second aspect of current quasi-experimental one-group pretest-posttest design was the receptive skill of reading in terms of critical thinking. The reading skills of the students were assessed on six standards and elements of critical thinking; accuracy, clarity, precision, depth, relevance, and logic. The following tables explain.

Table 4.3: *Comparison of pretest-posttest over critical thinking standard of 'accuracy' (N=27)*

CT Standards	Test	Mean	SD	SEM	t	p
Accuracy	pre-test	2.2222	0.50637	0.09745	2.255	0.028
	Post-test	2.5556	0.57735	0.11111		

Table 4.3 shows pre-test and post-test scores mean on the part of the students with respect to their performance in reading test. The mean score on pretest (2.2222) and on posttest (2.5556) clearly narrates difference. Furthermore, p value is (0.028) which is less than level of significance i.e. (0.05). It means that mean scores of the subject has a statistical difference. The students performed better after they received treatment in the form of critical thinking intervention.

Table 4.4: *Comparison of pretest-posttest over critical thinking standard of 'clarity' (N=27)*

CT Standards	Test	Mean	SD	SEM	t	p
Clarity	pre-test	1.8889	0.50637	0.09745	3.298	0.002
	Post-test	2.3704	0.56488	0.10871		

The table 4.4 is about students' reading test for critical thinking standard or element of 'clarity'. Here, the mean score (1.8889) is for pretest and (2.3704) is for posttest. Similarly, p value of (0.002) is less than (0.05) which reflects that mean scores difference is statistically

significant. Safely, it can be said that students after receiving treatment in critical thinking intervention have performed well.

Table 4.5: Comparison of pretest-posttest over critical thinking standard of 'precision' (N=27)

CT Standards	Test	Mean	SD	SEM	t	p
Precision	pre-test	1.8519	0.60152	0.11576	2.448	0.018
	Post-test	2.2222	0.50637	0.09745		

Table 4.5 gives information about the element of 'precision' within the critical thinking umbrella. Here, pretest mean score (1.8519) and posttest mean score (2.2222) are reflecting difference. This is further clarified by p value of (0.018) which is lesser than the standard value of (0.05) as level of significance. The students, can be said to have better performance after intervention in critical thinking.

Table 4.6 : Comparison of pretest-posttest over critical thinking standard of 'depth' (N=27)

CT Standards	Test	Mean	SD	SEM	t	p
Depth	pre-test	1.4074	0.57239	0.11016	6.850	0.000
	posttest	2.4815	0.57981	0.11158		

Table 4.6 narrates students' performance in reading standard of depth as an aspect of critical thinking. Here, the mean score (1.4074) of pretest and (2.4815) of posttest signifies difference. It is further strengthened by p value (0.000) which is obviously lesser than (0.05) as level of significance. There is statistical difference in the mean scores and hence, it is clear that students have better performed after receiving treatment in critical thinking.

Table 4.7: Comparison of pretest-posttest over critical thinking standard of 'relevance' (N=27)

CT Standards	Test	Mean	SD	SEM	t	p
Relevance	pre-test	1.2593	0.44658	0.08594	8.437	0.000
	posttest	2.4444	0.57735	0.11111		

Table 4.7 above portrays students' comprehension of 'relevance' as standard of critical thinking. The pretest mean score (1.2593) with posttest mean score (2.4444) have difference. The p value (0.000) is also less than (0.05) which shows mean difference in statistical terms. It is significant that students performed on posttest as compared to pretest when they underwent through critical thinking intervention.

Table 4.8: Comparison of pretest-posttest over critical thinking standard of 'logic' (N=27)

CT Standards	Test	Mean	SD	SEM	t	p
Logic	pre-test	1.2593	0.52569	0.10117	8.915	0.000
	posttest	2.5926	0.57239	0.11016		

Table 4.8 describes scores on pretest and posttest of critical thinking standard of 'logic'. In reading, students used logic in better way as reflected in the mean difference of pretest (1.2593) and posttest (2.5926). Also, the p value (0.000) is lesser than (0.05) as level of significance, reflecting statistically significant difference in mean scores. It is clear students performed well after receiving critical thinking intervention.

Table 4.9: Comparison of pretest-posttest over critical thinking reading standard as a whole (N=27)

CT Standards	Test	Mean	SD	SEM	t	p
Total Pre-test achievement scores	pre-test	10.0000	1.27098	0.24460	11.152	0.000
	posttest	14.3333	1.56893	0.30194		

It is obvious from table 4.9 that there were 27 students in the experimental group. The academic achievement was calculated through the difference of scores in pre-test and post-test in terms of students' reading skills. The means of results indicate that there was improvement in the students' performance after the intervention. Standard deviation mean scores difference of pre-test and post-test indicates least spread.

The difference of mean scores in group in pre-test and post-test was calculated in to 4.3333. Furthermore, the level of significance is 0.000 which is less than alpha value. The value of p is less than alpha value (0.05) indicating significant statistical difference in academic achievement of students in experimental group, before and after the intervention in reading skill.

## VII CONCLUSIONS

The following were the conclusions of the study.

### 5.1 Conclusions

- 1 Significant difference in academic achievement of pre-test and post-test of writing skill was concluded due to CT intervention. In this connection the academic achievement of students in experimental group, before and after the intervention in writing skill was improved. Written test was given to check the accuracy, clarity, relevancy and logic about the positive and negative effects of technology on relationship. Reasons were provided on the basis of intellectual standards of critical thinking. Relevant examples were provided in the favour of their answer. The answers of students after intervention were free of errors and accurate. There was no ambiguity found in their written response. Most of the answers were relevant to the topic regarding effect of technology in relation to human life. They have not written irrelevant material. Logic was given in their answers by giving the examples from the daily life. It was concluded that students were clear, accurate, relevant and logical in their writing skill after intervention.
- 2 Seven paragraphs (A-G) were provided to the students to check the reading skill after intervention. Clarity, accuracy, relevancy and logic were the standards to check the critical thinking of students. Significant difference in academic achievement of pre-test and post-test of reading skill was concluded. In this connection the academic achievement



of students in experimental group, before and after the intervention in reading skill was improved. Seven paragraphs were given to check the accuracy, clarity, relevancy and logic in all paragraphs. Reasons were provided on the basis of intellectual standards of critical thinking. Relevancy was being found in their reading skill. The pronunciation of students after intervention was free of errors and accurate. There was no ambiguity found in their reading response. Logic was given in their reading by giving the examples from daily life. It was concluded that students were clear, accurate, relevant and logical in their reading response after intervention.

### VIII RECOMMENDATIONS

- i. Modern teaching methods like blended learning, cooperative teaching and other student-centered methods of teaching should be encouraged by higher education departments in order to achieve the goal of developing critical thinking among higher education students.
- ii. One of an easy way to develop critical thinking among students is to encourage 'questioning'. Teachers are recommended to develop a conducive learning environment in the class allowing students to raise questions freely, participate in thinking of divergent nature in class, to stay mentally and physically active, to solve issue of academic and social nature, on account of divergent thinking.
- iii. Student teachers should be provided with content by teacher educators that let them understand intellectual standards and apply later in order to entertain deeper understanding.
- iv. Passive occurrence of deeper learning cannot take place if students are mere receiver of information. Here, teachers are recommended to let students participate actively in classroom which can be encouraged via strategies like discussion, reasoning, and meaningful questioning.

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