



RESEARCH PAPER

A Study to Assess Critical Thinking Skills among Prospective Teachers

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ABSTRACT

The presents study was designed to assess the development of critical thinking skills among prospective teachers. Prospective teachers of three universities of Lahore offering teacher training program constituted the population of the study. The subjects of the study were only those students who were nearly to complete their Master's degree. A sample of 160 students (University 1= 100 students, University 2= 40 students and University 3=20 students) was selected through stratified random sampling technique. A standardized test, "Watson-Glaser Critical Thinking Test" specially designed to examine critical thinking of graduate students, was administered as achievement test. The test is further categorized into 5 sub-sets. The analysis of results indicated that majority of the students (75%) scored less than 50 % marks in the test. Further the students performed worst in the sub-skills; inference, assumption, deduction, and analyzing arguments. Participants performed comparatively better in the sub-skill "interpreting information". The present situation, in the light of the results of this study, is alarming for teacher education programs. It was concluded that teacher education program, under study, was not performing effectively for the critical thinking development. It is recommended to the teacher educators and curriculum developers to take practical actions to improve the existing situation

Introduction

Critical thinking development is one of the 21st century educational objectives. It has been the focus of national educational documents of Pakistan such as National Education Policies and National Professional Standards for Teachers (2009) to promote critical thinking in students. Critical thinking is the ability that can be developed under carefully structured environment. The instructional

practices may develop these skills amongst students. Further, the research has proved that the teachers having sound skills of critical thinking are likely to promote these skills in their students.

Critical thinking is defined differently according to its function, forms, elements, and the strategies used to enhance it. However, not all of these elements are always found in one definition. Some definitions emphasize the cognitive psychologist or behavioral psychologist perspectives while other definitions hold more philosophical perspectives emphasizing social and political issues. McPeck's (1990) definition focuses on the attitude and disposition component that defines a critical thinker. He characterizes critical thinking as one single attitude. Critical thinking to McPeck is reflective skepticism where students question the relevance of information and seek the truth to independently reach a conclusion. He characterizes critical thinkers as those who are able to think for themselves. Critical thinkers have the confidence to choose what to believe from what they hear or read.

Watson and Glaser's (2002) definition of critical thinking combines both the thinking skills components and the attitude components of a critical thinker. Watson and Glaser argue that critical thinking is a composite of different skills that incorporates attitude, knowledge and cognitive abilities. They define critical thinking as:

attitude of inquiry that involves an ability to recognize the existence of a problem and acceptance of the general need for evidence in supporting what is asserted to be true; knowledge of the nature of valid inference, abstraction, and generalization in which the weight of accuracy of different kinds of evidences are logically determined, and skills in employing and applying the above attitude and knowledge (p.1).

This definition is one of the most cited definitions of critical thinking among scholars which covers almost all the elements of critical thinking. For the purpose to assess the development of critical thinking, Watson and Glaser developed a critical thinking appraisal test that has become one of the widely used tests today.

Development of critical thinking listed as one of the important skill that education aims to develop. In the 21st century, the need to produce critical thinker becomes more curtail where knowledge rapidly accelerating (Marin & Halpern, 2011). The researchers have consensually emphasized the need and importance of critical thinking for civic as well as educational life. But the question of nature of critical thinking development is controversial amongst researchers. In this regard we find two opinions, the one that critical thinking is an innate ability and the other is, critical thinking is the skill to be acquired through teaching learning process. As Judith et al. (1985) advocates critical thinking to be learned through natural developmental process.

Willingham (2007) addresses the issue of teach ability of critical thinking in a way that a 3 years old may engage in and even an adult may fail to have it.

Research on critical thinking development has shown that students' critical thinking does improve through instruction. In his study, Abrami et al. (2015) concluded in a meta-analysis empirical research that the students developed their critical thinking skills when instructed accordingly. He also came with the result that it is positively related to the students' achievement.

Junsay (2016) conducted an experimental study by dividing students into groups. The control group was taught by lecture method while the treatment was taught through reflective learning and the reflective learning approach was found more effective for the development of critical thinking in prospective teachers.

Some other studies also endorse the positive effect of critical thinking skills on students' achievement (Bećirović, BrdarevićČeljo, 2018; Bećirović et al., 2019).

While discussing the instructional interventions to promote critical thinking, Abramiet al. (2015) stated that two are the key: (a) collaborative and cooperative learning and (b) using real life examples, situations and problems.

Further, In order to foster critical thinking in students, it is necessary to first nurture teachers' critical thinking. Teachers who think critically are better able to help their students think critically (Paul & Paul, 2010). So the role of teacher becomes crucial to prepare the new generation to cope the challenges of rapidly changing world. If teachers are required to create a dynamic environment in classrooms, they must be trained in the same way. One of the important elements of teacher training programs is should be the open discussion of cognitive processes. Empirical studies proved that the explicit teaching addressing thinking will increase the learn ability of students towards understanding of the thinking processes and their application (Kong, 2006).

Incorporating critical thinking in teaching, teachers need to be dynamic in taking decision for accomplishment of objectives by adapting contents, strategies and methods, and of course, evaluation techniques. They are the decision makers, critical and reflective thinkers who can change their students' lives. The situation demands them to be reflective not receptive. Per-service teacher education programs must search the ways to promote such skills in prospective teachers to meet 21st century goals (Raines, 2015).

Delimitations of The study

The effectiveness of two year teacher education program regarding the development of critical thinking was examined. The study is delimited to teacher training institutes of Lahore.

Material and Methods

The present study aimed to examine the development of critical thinking in prospective teachers. The research was quantitative in nature. Participants' critical thinking development was measured through achievement test. Students enrolled in two year teacher education program after fourteen year education in public sector teacher training institutes of Lahore is the population of the study. As the study is delimited to teacher training institutes of Lahore, Three renowned institutes were selected stratified random sampling technique. 20% students from each strata were selected. Total 160 students (population=800 students), who were nearly to complete their degree of two year teacher education program after graduation, appeared in the test. The table of population and selected sample is presented in table 1.

Watson-Glaser Critical Thinking Test (2002) comprising five sub-skills including inference, recognition of assumption, deduction, interpretation, and evaluation was used to measure the critical thinking skills of the participants. It is publically available, widely used for research purpose to measure students' achievement on critical thinking. The test contained forty MCQs type test items; eight question in each sub-set. The test was reviewed by subject experts and was found suitable to conduct in the present context. The test was conducted in comfortable setting with zero distortion. Students were given a flexible time to solve the questions.

Table 1
Description of population and sample of the study

University	Population (N)	Sample (N)	Percentage
University 1	500	100	62.5
University 2	200	40	25
University 3	100	20	12.5
Total	800	160	100

Results and Discussion

The data of the study were analyzed through SPSS applying descriptive statistics. The overall marks of participants on Watson-Glaser Critical Thinking Appraisal are given below. Participants' marks on each sub-set have also been reported separately to present a clearer picture of students' critical thinking development.

Table 1
Participants' overall marks on Watson-Glaser Critical Thinking Appraisal

Obtained Marks (Total Marks=40)	Frequency (No of Students)	Percentage
24	5	3.125
23	12	7.5
22	9	5.625

21	9	5.625
20	5	3.125
19	25	15.625
17	35	21.875
16	15	9.375
15	15	9.375
14	11	6.875
13	12	7.5
11	7	4.375

The table 1 showed participants' overall marks on Watson-Glaser Critical Thinking Appraisal. The highest marks were 24 out of 40 which are only 60% of total marks are. It is evident that only 3 students (3.7%) obtained 24 marks. The lowest marks are 11 out of 40. If categorize these marks into two categories i.e. 50% and above and below 50%, it makes following division.

Table 2
Division of high, average and low achievers

Categories	Frequency	Percentage
50% and above	40	25
Below 50%,	120	75

Division of participants into two categories showed that only 25% students could achieve 50% and above 50% marks while the rest of the students i.e. 75% couldn't achieve even 50% marks and scored below.

The sub division of marks on the basis of students' achievement on critical thinking sub-skills is given below:

Table 3
Participants' marks on the sub-set 'Inference'

Obtained Marks (Total Marks=08)	Frequency (No of Students)	Percentage
4	6	3.75
2	90	56.25
0	64	40

The results of the table 3 showed participants' marks on the sub-set 'Inference'. The highest marks on this sub-set are 4 out of 8 (50 %) which is very disappointing and at the same time alarming. Further, only 6 students (3.75%) got 4 marks. Whereas, 90 (56.25%) students obtained 2 and 64 (40%) students got 0 marks out of 8.

Table 4
Participants' marks on the sub-set 'Assumption'

Obtained Marks (Total Marks= 08)	Frequency (No of Students)	Percentage
6	17	10.63
5	12	7.50
4	29	18.13
3	35	21.88
2	43	26.88
1	24	15.00

Participants' marks on the sub-set 'Assumption' has been shown in the table 4. Seventeen (10.63%) obtained 6 marks. Students performed worst on this sub-set as well because 102 students (62%) obtained only up to 3 marks out of 8.

Table 5
Participants' marks on the sub-set 'Deduction'

Obtained Marks (Total Marks= 08)	Frequency (No of Students)	Percentage
7	6	3.7
6	6	3.7
5	38	23.5
4	53	33.3
3	40	24.7
2	18	11.1

For the sub-set 'Deduction', again more than half students (91 students, 57%) obtained 4 or 5 marks out of 8. Only 12 students (7%) got 6 and 7 marks while 58 students (36%) obtained only 2 or 3 marks on the sub-set 'Deduction'.

Table 6
Participants' marks on the sub-set 'Interpreting Information'

Obtained Marks (Total Marks= 08)	Frequency (No of Students)	Percentage
7	53	33.3
6	24	14.8
5	41	25.9
4	18	11.1
3	6	3.7
2	18	11.1

The results in table 6 showed participants' marks on the sub-set 'Interpreting Information'. The highest marks on this sub-set is 7 and lowest is 2. In this sub-set, students performed comparatively better where 53 student (33.3%) got 7 marks. 55 students (40%) got 6 and 5 marks.

Table 7
Participants' marks on the sub-set 'Arguments'

Obtained Marks (Total Marks= 08)	Frequency (No of Students)	Percentage
8	6	3.7
7	6	3.7
6	24	14.8
5	53	33.3
4	47	29.6
3	12	7.4
2	12	7.4

For the last sub-set 'Argument', the results showed that 12 of the students (7.4 %) got 8 and 7 marks while most of the students (78%) again performed worst and obtained marks between 6- 4. Further, 24 students (14.8%) got only 3 and 2 marks.

Conclusion

The study aimed to examine critical thinking skills in prospective teachers. The results uncovered drastic situation showing that the teacher education program was not working effectively for the promotion of critical thinking amongst prospective teachers/future teachers. Students as the participant performed poor in Wastson-Glaser Critical Thinking Appraisal. Test carried 40 marks in total while the highest marks obtained by students were 24 which are only 60% of total marks. Further the students performed worst in four sub-skills, inference, assumption, deduction and argumentation. They performed comparatively better in the sub-skill 'Interpreting Information' only.

The results are alarming for the teacher education programs and related responsible authorities. Prospective Teachers are supposed to control and direct the learning of young generation. The present era demands education to produce individuals with sound thinking abilities and dynamic application of higher order thinking. It is supported by the researches that the teachers having less knowledge of critical thinking are likely to be unsuccessful to practice critical thinking strategies in classroom teaching. So, the present scenario places responsibility on teacher training programs to produce critical thinkers in their institutions who would be able to ultimately develop the thinking skills of their students. But, the results of the present study drew a threatening picture in front of us.

As critical thinking is a learnt skill, there is a dire need to change the existing practices to train future teachers. The curriculum designed must put its considerable attention towards infusion of critical thinking in the courses offered. Further, teacher educators should adopt the critical thinking strategies in their teaching. One of the important aspect is to aware the educators' with the conceptions of critical thinking

and practices to develop critical thinking in their students. For this purpose, specialized training sessions should be organized within and outside the institutions.

Incorporating critical thinking in teaching, teachers need to be dynamic in taking decision for accomplishment of objectives by adapting contents, strategies and methods, and of course, evaluation techniques. They are the decision makers, critical and reflective thinkers who can change their students' lives. The situation demands them to be reflective not receptive. Per-service teacher education programs must search the ways to promote such skills in prospective teachers to meet 21st century goals (Raines, 2015).

It is also needed to change the assessment and evaluation practices by the teacher educators. Assessment practices should strongly discourage the culture of memorization and rote learning. Students should be given credit on the basis of the application of their thinking processes in the examinations. In short, all the aspect of teacher education programs, from the development of curriculum to assessment and evaluation, should be designed in the way that promote and accelerate the development of critical thinking among prospective teachers.

In the light of results, it is concluded that the teacher education program, under study, is not working effectively for the promotion of critical thinking skills which are one of the educational objectives of 21st century.

There is need to bring a positive change by altering our teaching and learning practices towards the achievement globally set goals. The courses should be designed and so should be taught to promote higher order thinking.

Recommendations

Research studies may be conducted on this issue by adopting different dimensions. The present study was conducted to assess the critical thinking development in passing out students. While longitudinal study may be conducted to examine the improvement in the development of critical thinking in throughout the duration of teacher training by collecting data at start, then periodically then by the end of the program to get a clearer picture of teacher education programs' effectiveness to develop critical thinking.

Comparative studies may be conducted by assessing the effectiveness of multiple teacher education programs regarding the development of critical thinking.

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