

EXPLORING KNOWLEDGE OF CRITICAL THINKING SKILLS OF PRE-SERVICE TEACHER TRAINEES AND THEIR TEACHING PERCEPTIONS

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Abstract

The focus of this paper is to investigate Taungoo Education College pre-service teacher trainees' knowledge about the general concepts of critical thinking, including its skills. Moreover, this study explored their perceptions about critical thinking regarding implementation in the classrooms with a purpose of promoting teaching¹ and learning process.

The participants in this study were from two teacher education programmes at Taungoo Education College: 1) Certificate in Teacher Education students and 2) Diploma in Teacher Education students at Taungoo Education College. The study was conducted with 36 male trainees and 36 female trainees from each programme. Therefore, totally 72 trainees participated in this study.

The quantitative method was used, employing a three-part instrument. The quantitative data was analyzed with SPSS software program (ver. 25.0), using sums, means and standard deviations of pre-service teacher trainees' responses on the questionnaires. Two sets of questionnaire survey were used to investigate the pre-service teacher trainees' knowledge about the general concept of critical thinking and its skills, and their teaching perceptions. The first set consists of three sections adopted from Elder et al (2007), and Al-degether (2009) whereas the second one is a 5 point Likert scale which was revised by Stedman and Adams (2012).

According to the findings of the current study, pre-service teacher trainees who were enrolled at Taungoo Education College were found to have knowledge about critical thinking skills to some extent. However, the present study proved that pre-service teacher trainees held positive perceptions about the value of teaching critical thinking. The current study recommends that critical thinking skills should be emphasized in teacher education preparation programmes in order that pre-service teacher trainees themselves achieve 21st century skills and promote critical thinking in their future classrooms.

Keywords: critical thinking, perceptions, pre-service teacher trainees

Introduction

The intellectual roots of critical thinking are as ancient as its etymology, traceable, ultimately, to the teaching practice and vision of Socrates over 2,500 years ago. From Socrates to contemporary scholars, there have been continuous calls for the need of educated citizens and qualified workforce and citizens' capability to think critically. As the world is moving toward a technology-based economy, facing worldwide competition, there is a growing need for workers with analytical thinking skills who have the ability to integrate information from a wide range of sources and competently make fruitful success decisions. In a complex and swiftly altering world, critical thinking skill is an essential tool in order to successfully perform in the competitive life.

In the early twentieth century, John Dewey (1910, cited in Stanford Encyclopedia of Philosophy) introduced the term "critical thinking" as the name of an educational goal and identified with a scientific attitude of mind. He argued in 1938 that learning to think is the fundamental objective of education. The emphasis has been shifted from imparting information and content to the learners, to enhancing their thinking skills. Howie (2011) highlighted that the ability to think critically is one of the highest levels of mental activity.

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Educators have perceived it as a critical and important skill although it is not clear how useful it can be when incorporated in the education college programmes. In general, the job market and education view critical thinking as an essential skill at work and during training. Apart from subject competencies, higher learning institutions (HLIs) are challenged to produce graduates who can think critically.

Professor Frank Hardman et al (2013) quoted in his study on “Development of a Teacher Education Strategy Framework Linked to Pre- and In-Service Teacher Training in Myanmar” that PRESET and INSET are in need of radical reform if they are to deliver teacher education appropriate for the 21st century and produce teachers with the right value, skills and knowledge to be effective practitioners to bring about the desired outcomes of education. He also reported in his case study conducted in 2014 on “Teaching practices in Myanmar” that Myanmar primary teachers rely only on a single method made up of teacher-fronted “chalk and talk” promoting the transmission of knowledge and rote-learning. It was one of the studies conducted during “Comprehensive Education Sector Review (2012-2015)”, which was undertaken by MOE, Myanmar for three and a half years. As a result, in Strategy 1 of Basic Education: Access, Quality and Inclusion, part of National Education Strategic Plan (2016-2021) of Myanmar, it is mentioned to redesign the basic education curriculum emphasizing 21st century skills.

According to International Bureau of Education, UNESCO, critical thinking is one of the most important 21st century skills. Most of the core competencies or skills frameworks seem to coverage on a common set of 21st century skills or competencies, namely: creativity; critical thinking; collaboration; communication Technology (ICT) literacy; and social and/or cultural competencies including citizenship.

Obviously, critical thinking skills need to be enhanced by teachers in their classrooms. However, Lauer (2005) argued that teachers might not be fully aware of the methods and strategies to integrate critical thinking skills into their classes. As the education colleges may only rely on the traditional teaching practice like chalk and talk method, this might be the reason that teachers face trouble when trying to integrate critical thinking into their teaching learning process. Ozkan-Akan (2003) stressed that perceptions of teachers have a crucial impact on the improvement of students’ critical thinking abilities. Similarly, as mentioned in the study of Kowalczyk, Hackworth and Case-smith (2012), teachers’ lack of adequate theoretical and practical awareness of critical thinking skills is possibly obstructing their proficient ability to facilitate the enhancement of critical thinking skills among students.

In order to inquire this issue in more detail, the current study was determined to explore the extent of knowledge the pre-service teacher trainees have about critical thinking skills and their current perceptions about critical thinking instruction.

1.1 Significance of the study

Research should be increasingly conducted to better understand the efficient means to enable teachers to fulfill their teaching duties and help their students acquire critical thinking skills. Understanding the teachers’ level of knowledge about critical thinking skills and their perceptions would provide useful information to enhance teacher education programs. The current study attempted to contribute to the purpose of improving the Myanmar education system by examining the pre-service teachers’ knowledge and perceptions about critical thinking skills. This study may help the decision-makers and teacher education curriculum and material

developers get useful suggestions to keep the teacher education programs in Myanmar updated in order to be in line with international teacher education standard.

1.2 Statement of the problem

The purpose of this study was to explore pre-service teachers' knowledge concerning critical thinking skills. Moreover, it was designed to investigate the perceptions of pre-service teachers towards the teaching of critical thinking skills. Teachers play a very critical role in the learning process and personal skills of their learners. They can significantly reinforce the way their learners think. Kowalczyk et al. (2012), therefore, stated that their perceptions toward teaching critical thinking skills and their lack of adequate awareness of thinking skills can also be a limitation to their ability to assist the learning process.

Although teachers may intend to teach at a higher level, which contain critical thinking skills, unfortunately, their perception and knowledge about this is inadequate. Gathering information regarding the knowledge and perception of pre-service teachers about teaching of critical thinking skills would be a valuable stage in the process of establishing a model of providing the best quality critical thinking instruction in their classrooms.

Sng (2011) suggested that critical thinking skills may vary depending on varieties of cultures, values and educational backgrounds. This means that critical thinking cannot be connected to intellectual skills alone. The way we think critically about the world around us is deeply affected by the construction of morals, principles, and spirituals views. Therefore, this study was intended to examine the knowledge and perceptions of critical thinking of pre-service teachers at Taungoo Education College. The aim of this study was to explore the patterns of pre-service teachers' understanding of basic critical thinking concepts and personal perceptions regarding critical thinking instruction.

1.3 Objectives of the study

The objectives of the present study are:

- (1) To identify the knowledge of the pre-service teacher trainees regarding critical thinking skills.
- (2) To explore the perceptions of the pre-service teacher trainees on critical thinking skills.
- (3) To make practical recommendations based on the findings of the study regarding the implementation of the critical thinking in the teacher education context of Myanmar.

1.4 Research Questions

This study addressed the following research questions:

1. What is pre-service teacher trainees' knowledge regarding the critical thinking skills?
2. What are the perceptions of the pre-service teacher trainees, enrolled in Education College, regarding critical thinking skills?

Review of Related Literature

Critical Thinking is important for shaping the way students learn and think in today's information age. Critical thinking was defined by Facione (1990) as "purposeful, self-regulatory judgment, which leads to interpretation, analysis, evaluation, and inference, as well as explanation of evidential, conceptual, methodological, or contextual considerations upon which that judgment is based".

The definitions of critical thinking are diverse in terms of breadth and inclusiveness. While Ennis (2001) roughly defined it as reasonable and reflective thinking that is focused on deciding what to believe or do, Nosich (2009) saw it as more than making decisions; it is a meta-cognitive, reasonable, and authentic process that involves high standards and such concern as accuracy, relevance, and depth. Similarly, Fisher (2007) defined it as “a kind of evaluative thinking- which involves both criticism and creative thinking and which is particularly concerned with the quality of reasoning or argument which is presented in support of a belief or a course of action”. Recently, Weissberg (2013) argued that the definitions of critical thinking are varied, but still have certain traits in common, remarkably the capability to invest reason to go further beyond the process of acquiring facts to reveal deep meaning.

According to Willingham (2007), there are specific types of critical thinking that are characteristic of different subject matters. It is generally agreed by the academia that establishing a universally-accepted definition of critical thinking is difficult. As for Halonen (1995), it indeed gains popularity in education but known as “is in a mystified state because no single definition is widely accepted”. Sukie (2004) agreed that it “lacks clear consensus”.

Facione (1990) mentioned that for better support the instruction and assessment of critical thinking, a consensus definition was given by an expert Delphi Panel of the ‘American Philosophical Association’ (APA), trying to incorporating both thinking dispositions characterized as “habits of mind”, and cognitive skills and sub-skills:

Table 1 Critical Thinking Cognitive Skills and Sub-skills (Facione, 1990)

Skills	Sub-skills
1. Interpretation	Categorization, decoding significance, clarifying meaning
2. Analysis	Examining ideas, identifying arguments, analyzing arguments
3. Evaluation	Assessing claims, assessing arguments
4. Inference	Querying evidence, conjecturing alternatives, drawing conclusions
5. Explanation	Stating results, justifying procedures, presenting arguments
6. Self-regulation	Self-examination , self-correction

There is no denying that understanding *what we think and how we think* can result in a more explicit outcome in critically thinking, however, whether the functions and characteristics of critical thinking can enhance a good thinker in reasoning and logic after classroom instructions remains contentious.

2.1 21st century skills and Global Education Roadmaps

The 21st century is characterized by its rapid technological advancement. Castells (2010) described the 21st century as a period of intense transformation, is an unprecedented era as business operations have become so globalized that core business competencies place greater emphasis on knowledge, mobility and collaboration. According to Levy and Murname (2004), such businesses now call for a human workforce with expert thinking and complex communication skills as machines replace human beings in routine and manual work. Berry (2010) pointed out that education plays an integral role in preparing learners to become global and conscious citizens, and also to be ready for challenges associated with the highly mobilized and technology-dominated society. Scholars in the field of education have thus advocated to modify the education system to support the development of the requisite skills and literacies (Dunning, 2000; UNESCO, 2003; Levy & Murname, 2004; Pigozzi, 2006; Kozma, 2008; Black, 2009).

A range of international, national and more localized technology and information literacy frameworks have emerged to provide outcome benchmarks for the needed curricular reforms.

A number of frameworks for the 21st century and digital skills that have been adopted in different education policy environments around the world. Similarly, policy makers who decide to incorporate 21st century skills education into their curricula need to back up the changes with a well-articulated execution plan.

However, Silva (2009) pointed out that although the term ‘21st century skills’ might sound modern, some of these skills are “not new, just newly important”. Vital capabilities such as critical thinking and problem solving have always been essential. By mapping out the current landscape of 21st century skills development, these skills can be seen to have a stronger presence in curricula and that there is an even stronger need for a detailed, well-researched approach to guide educators, school administrators and policy makers through the intricate process of implementing 21st century skill education.

2.2 Frameworks Developed for Critical Thinking Skills

With the aim of strengthening one's understanding towards 21st century skills, many frameworks have been drawn up under the support of international organizations, governments and consulting firms. Among the vast range of frameworks, three of them have been chosen to illustrate the emergence of the main ideas and notions. It is hoped that these frameworks would represent the different perspectives one holds towards 21st century skills understood by both western and eastern societies, as well as by different education institutions and business corporations.

2.2.1 Framework based on OECD countries (2009)

Ananiadou and Claro (2009) developed the OECD framework was entitled “21st Century Skills and competences for New Millennium learners in OECD countries”. In an attempt to provide clear definitions and understanding of the skills and competencies related to the 21st century, the authors examined and critically reviewed the effects of Information and Communication Technology (ICT) on young people, together with the consequential changes in the teaching and assessment systems of some OECD countries.

This framework was based on the competences and skills found in those countries in relation to the role of ICT in education. The three major dimensions of the framework include communication, information and ethics and social Impact.

2.2.2 Assessment and Teaching of 21st Century Skills [ATCS]

The Assessment and Teaching of 21st Century Skills [ATCS] is an international research initiative headquartered at the University of Melbourne and sponsored by Cisco, Intel and Microsoft. The group aimed at identifying and helping learners acquire the necessary skills needed to be successful in the 21st century workplace. The research group devoted its effort to analyzing the roles of standards and assessments in promoting learning, taking into consideration the use of technology in transforming assessment systems and education. The ATCS categorized 21st century skills into four prime types, namely: ways of thinking; ways of working; tools for working and; living in the world.

2.2.3 Partnership for 21st Century Skills [P21] (2009)

The American organization founded in 2002 conceptualized a framework for 21st century skills. This framework has become well-known in the field of information technology (IT) in education. It consists of eleven competencies which are classified into three gist elements including (1) learning and innovation skills (2) information, media and technology skills and (3) life and career skills. The framework also entails a support system that embodies standards, assessments, curriculum, instructions, professional development and learning environments. This can be illustrated as the following figure.

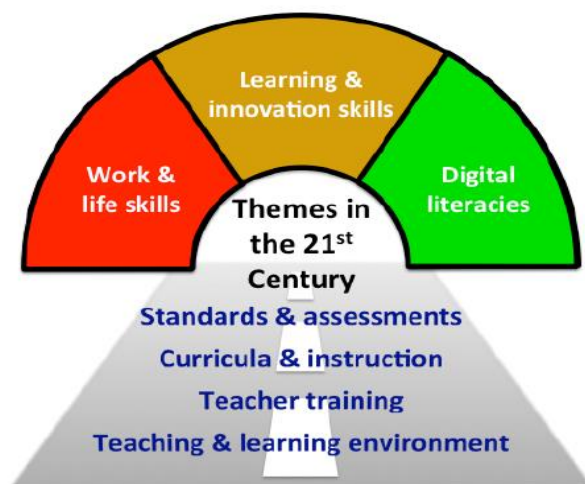


Figure 1 Rainbow illustration of the Partnership for 21st Century Skills Framework

2.3 Importance of Teaching Critical Skills

According to an American psychologist, Dr. Diane Halpern (2003), there has been substantial evidence showing that critical thinking can be improved with training. Research also suggested that improving critical thinking ability has a knock-on effect in improving problem-solving ability, openness, creativity, organization, planning and making the right choices in life.

According to Anisa Zulfiqar (2018), the Business Development Manager of Asia-Pearson APAC, there is a gap in critical thinking teaching at school and the ability to apply this skill at university or in the world of work. She also recommended some techniques to teach both teachers and students critical thinking skills and create a critical thinking culture in classrooms and schools as in the followings.

1. The first step to create a critical thinking culture is to introduce the concept with a good definition.
2. Moreover, all levels including teachers and students should be provided with opportunities for deeper learning (reflection, application, guided discussion).
3. It is also required to establish the importance of seeking evidence, closely examining reasoning and assumptions, analyzing basic concepts, and tracing out implications.
4. A model or framework of critical thinking should be introduced to organize and expedite learning. For example, the RED model developed by Goodwin Watson and Edward Glaser in 1930s.

Recognize assumptions: This relates to the ability to separate fact from opinion in an argument.

Evaluate arguments: This is the ability to analyze information objectively accurately, question the quality of supporting evidence and understand how emotion influences the situation.

Draw conclusions: This is the ability to arrive at conclusions that logically follow from the available evidence.

5. Assessment to measure the current levels of critical thinking in teachers should be introduced and a development programme should be provided for those who need support. The ability to teach critical thinking to students starts with teachers having a good understanding on the concept first.

Methodology

To accomplish the objectives and fulfill the purpose of the study, the quantitative method was used to collect responses of the participants. The study employed a survey design. Stedman, and Adams (2012) argued that this approach is appropriate for such a study.

3.1 Participants

Participants of the current study were seventy-two students enrolled in pre-service teaching program in Taungoo Education College during the academic year 2018/2019. The participants were selected using a sample random selection. The majority of them will be teachers after second year program.

3.2 Data Collection Instrument

A Three-part instrument was used in the study. The first one is short demographic information about respondents including gender, specialization, level of study, age and previous experience (Matriculation exam scores).

The second one is to measure the participants' knowledge about critical thinking. It consisted of three sections adopted from Elder et al, (2007), and Al-degether (2009). The first section has sixteen statements that required participants to select the skills that are related to critical thinking. The participants were required to identify these skills by selecting "Yes" if they thought that the statement was one of the critical thinking skills or choosing "No" if they thought that the presented statement was not a skill of critical thinking. The second section includes six multiple-choice questions to determine the accuracy of an individual's knowledge of critical thinking.

The third section is on the nature of critical thinking, had nine True/False statements designed to gauge an individual's familiarity with specific critical thinking statements. For this part, that assesses pre-service teacher's knowledge about critical thinking, mean scores ranging from (0) to (0.35) reflected an inaccurate awareness of critical thinking. Mean scores ranging from (0.36) to (0.65) showed that the respondents had uncertain understanding of critical thinking, and mean scores ranging from (0.66) to (1) that pre-service teachers had accurate knowledge about critical thinking.

The third part was revised by Stedman and Adams (2012) from a list of questions first proposed by Choy and Cheah (2009). This part is intended to gauge participants' perceptions of critical thinking and critical thinking instruction. The revised questionnaire is comprised of 14 Likert-type statements using a scale of 1(Strongly Disagree) to 5 (Strongly Agree). Mean score within the range of (1 to 2.4) indicated disagreement opinion toward teaching critical

thinking. Mean scores of (2.5 to 3.4) indicated neutral opinion of teaching critical thinking. Mean score within the range of (3.5 to 5) indicated strong agreement about teaching critical thinking.

Further, the researcher translated the instrument into Myanmar language and it was reviewed by two specialists to check its face validity. The Myanmar version was discussed and revised until an agreement was reached on the final survey tool. Reliability was calculated by using testing and re-testing test-retest method and through the application of the questionnaire on an exploratory sample which consisted of (9) pre-service teacher trainees. The calculated Pearson correlation coefficient was (0.88). The stability coefficient was calculated according to the equation of internal consistency (Cronbach alpha), and the value of stability coefficient was (0.93). These values were considered appropriate for the purposes of the study.

3.3 Procedure

During the first semester in the academic year 2018/2019, questionnaires were distributed to the pre-service teachers in classroom. Pre-service teachers participating in the study were provided a verbal explanation of the study. To answer the question of the study, the following data analysis method was used: sums, means, and standard deviations of the teachers' responses on the questionnaires. The survey collected demographic data in order to identify the make-up of the responding sample. The quantitative data was analyzed with SPSS software program (ver.25.0).

Findings

Analyzing means and standard deviations of knowledge about critical thinking grouped by gender, by years attended, and by specialization, there were no significant differences in all areas of knowledge about critical thinking between the groups.

Computing means and standard deviations of perceptions on critical thinking skills grouped by gender and by year attended, there was no significant difference in perceptions on critical thinking between the groups by male and female while mean score of second year is greater than mean score of first year. It can be concluded that the perceptions on critical thinking skills of second year is higher than first year. Therefore, there was a significant difference in perceptions on critical thinking between the groups of year attended.

Table 2 Group Statistics of Knowledge and Perceptions on Critical Thinking Skills Grouped by Year Attended

Group Statistics					
	Year	N	Mean	Std. Deviation	Std. Error Mean
Skill	First	36	10.22	2.380	.397
	Second	36	10.81	1.925	.321
Nature	First	36	5.31	1.215	.202
	Second	36	5.11	1.348	.225
Accuracy	First	36	3.22	1.198	.200
	Second	36	3.08	1.228	.205
Perception	First	36	50.42	6.566	1.094
	Second	36	54.47	6.245	1.041

Table 3 Independent Sample *t* Test Results of Knowledge and Perceptions on Critical Thinking Skills Grouped by Year Attended

		<i>t</i>	df	<i>p</i>	Mean Difference
Skill	Equal variances assumed	-1.144	70	0.257	-0.583
	Equal variances not assumed	-1.144	67.065	0.257	-0.583
Nature	Equal variances assumed	0.643	70	0.522	0.194
	Equal variances not assumed	0.643	69.259	0.522	0.194
Accuracy	Equal variances assumed	0.486	70	0.629	0.139
	Equal variances not assumed	0.486	69.958	0.629	0.139
Perception	Equal variances assumed	-2.685	70	0.009	-4.056
	Equal variances not assumed	-2.685	69.825	0.009**	-4.056

* $p < .05$, ** $p < .01$, *** $p < .001$ at significant level

According to Table (2) and Table (3), there was a significant difference in perceptions on critical thinking between the groups of first year and second year ($p < 0.01$).

According to the means and standard deviations of perceptions on critical thinking skills grouped by specialization, there was no significant difference in perceptions on critical thinking between the group of arts and science.

Results and Discussion

This study was conducted to explore pre-service teachers' knowledge and perceptions about critical thinking. Survey research was conducted using the questionnaire instrument. To answer the research questions, statistical analysis of this study utilized descriptive statistics.

The first question was to identify the patterns of knowledge of pre-service teacher trainees regarding the critical thinking skills. This was accomplished through a systematic review of individual responses on the second part of the questionnaire with its three sections. The first section of this part explored pre-service teacher trainees' knowledge regarding the skills and sub-skills of critical thinking.

Table 4 Sum, Mean and Standard Deviation (SD) for Knowledge about Critical Thinking Skills

No.	The skill	Sum	Mean	SD
1	Examining relationships among statements.	21	.29	.201
2	Interpreting the meanings from variety of data or experiences.	44	.61	.491
3	Assessing the quality of ideas or data.	63	.88	.333
4	Identifying alternative claims and drawing conclusion.	62	.86	.348

No.	The skill	Sum	Mean	SD
5	Presenting results of one's reasoning.	50	.69	.464
6	Generating original and new insights.	62	.86	.348
7	Delivering information that committed to memory.	21	.29	.458
8	Generating questions from a particular topic.	68	.94	.231
9	Conforming, validating, or correcting one's reasoning procedure.	51	.71	.458
10	Working from specific facts to general principles.	43	.60	.494
11	Storing, retaining, and recalling information.	20	.28	.451
12	Separating relevant from irrelevant data.	66	.92	.278
13	Moving from a question or a problem toward one correct answer or a solution.	12	.17	.375
14	Making a prediction of what will happen in the future from given information.	51	.71	.458
15	Summarizing an article in one's own words	47	.65	.479
16	Analyzing an argument through sketching a graph or drawing a picture.	47	.65	.479

In the first section of the questionnaire, participants were required to distinguish the skills that were related to critical thinking. As could be seen in the table (4), no participant could correctly identify all skills or all items. The findings showed that the means of four out of the sixteen items existed in the low range (0-0.35) and the same pattern also existed in the (0.36-0.65) range. Therefore, the half of the sixteen statements existed in the high range (0.66-1). One of all items included in the low range with only twelve correct answers out of seventy two answers.

Table 5 Sum, Mean, Standard Deviation (SD) for Knowledge about Critical Thinking Skills

No.	The Statement	Sum	Mean	SD
1	It is important to clarify thinking whenever you are explaining something to someone; whenever someone is explaining something to you and; whenever you are analyzing an article or chapter.	39	.54	.502
2	Fair-minded thinking is connected with the accurate assessment of one's own reasoning.	9	.13	.333
3	Depth in reasoning best relates to complexities in the issue; logical interpretations; clarifying the issue.	37	.51	.503
4	One main requirement of critical thinking is to analyze thinking into its most basic components.	57	.79	.409
5	Critical thinkers assess thinking in order to determine what thinking to accept or what to reject.	42	.58	.496
6	An important fact that supports the need for an analytic dimension of critical thinking is that the analysis of thinking is presupposed in every subject.	43	.60	.494

As could be seen in table (5), there were a total of six statements to decide pre-service teacher trainees' familiarity with critical thinking concepts in the second section. Participants were required to select the correct completion of the statement out of three choices. Again, there was no single question where all respondents answered correctly, and only one mean score (0.79) existed in the high (0.66-1). The rest of the means was within the average and low range, with the

second statement, “Fair-minded thinking is connected with the accurate assessment of one’s own reasoning”, being answered correctly with only nine participants out of seventy-two trainees.

Table 6 Sum, Mean, Standard Deviation (SD) for Knowledge about Critical Thinking Skills

No.	The Statement	Sum	Mean	SD
1	As people grow older, they naturally develop as critical thinkers.	13	.18	.387
2	Critical thinking is self-disciplined.	70	.97	.165
3	Critical thinking enables one to think more deeply.	64	.89	.316
4	One should not analyze sympathetically points of view that are disgusting and obviously false.	35	.49	.503
5	If a statement is unclear, we benefit by asking what our purpose is in saying it.	66	.92	.278
6	Implications are conclusions you come to in a situation.	50	.69	.464
7	Critical thinking is important in learning to read well.	22	.31	.464
8	Critical thinkers use subjective standards to assess thinking.	29	.40	.494
9	Critical thinkers learn to ignore their emotions when making important decision	54	.75	.436

The third section included nine true/false statements investigating pre-service teacher trainees’ knowledge regarding the nature of critical thinking. Similarly, there was no single statement that participants correctly agreed about. The means of five statements were founded to exist in the high range. In the rest four statements, two items included in the average range and two, in the low range. It means that nearly half of pre-service teacher trainees had uncertain understanding of the nature of critical thinking. The mean score (0.18) of the first statement, “As people grow older, they naturally develop as critical thinkers”, fitted in the low range, with only thirteen correct answers.

Findings about pre-service teacher trainees who are enrolled in the Education College showed that they had poor knowledge regarding critical thinking which indicated that teacher students needed more preparation about critical thinking.

Table 7 Sum, Mean, Standard Deviation (SD) for Perceptions on Critical Thinking skills

No.	The Statement	Sum	Mean	SD
1	Critical thinking engages students’ higher order thinking (analysis, synthesis and evaluation).	315	4.38	.701
2	Critical thinking encourages students to become independent thinkers.	244	3.39	1.157
3	Critical thinking encourages students to become active learners.	270	3.75	1.148
4	Critical thinking can be used to achieve better learning outcomes.	287	3.99	.911
5	Critical thinking will allow students a better understanding of course topics.	271	3.76	1.132
6	I believe that it is my responsibility to promote critical thinking in my courses.	262	3.64	1.104
7	Critical thinking is a method of thinking which would help students enjoy the learning process.	265	3.68	1.085
8	Critical thinking should always include a reflective component.	294	4.08	1.045
9	I am aware when students use critical thinking in my	252	3.50	.919

No.	The Statement	Sum	Mean	SD
	courses.			
10	I look for specific evidence of critical thinking by students in my courses.	228	3.17	1.088
11	I have the skills necessary to promote critical thinking by students in my courses.	258	3.58	1.045
12	I think that students have barriers to critical thinking, regardless of the strategies I use.	248	3.44	1.073
13	If required, I could implement critical thinking into my courses.	295	4.10	.891
14	In order for me to fully implement critical thinking into my courses, I would need additional support.	287	3.99	1.000

Data analysis of the perceptions scale stated that the means of eleven statements out of fourteen fell into the high range of agreement. Participants expressed their strong agreement ($M=4.38$) with the statement “Critical thinking engages students’ higher order thinking (analysis, synthesis and evaluation)”. The second highest mean ($M=4.10$) was recorded for the statement “If required, I could implement critical thinking into my courses”. The third one ($M=4.08$) described that “Critical thinking should always include a reflective component”. With high mean scores, participants strongly agreed the eight statements to hold positive opinions toward critical thinking and teaching its skills. Within the average range of mean scores, participants were not sure about two statements. With the least mean ($M=3.17$), they also showed their doubt about item number 10.

Conclusion

This study revealed that very few of pre-service teachers who were enrolled at Taungoo Education College were found to have sufficient knowledge about critical thinking skills to somewhat degree. On the other hand, Lauer (2005) studied that EFL teachers did not have enough knowledge critical thinking concepts and skills to incorporate them into their classroom practice. Moreover, Kowalczyk, et al. (2012) claimed that teachers’ absence of sufficient knowledge of critical thinking skills could hinder their ability to assist critical thinking among their students. When taking into consideration that none of questionnaires’ statements was answered correctly by the participants, it can be concluded that the current teacher education programmes need to incorporate more instructions to apply critical thinking skills. Encouraging teacher educators at education colleges to incorporate critical thinking practices and techniques into their teaching-learning process will support pre-service teachers to have sufficient knowledge and concepts regarding critical thinking.

According to the current study, it was found out that pre-service teachers of Taungoo Education College held positive perceptions about the value of teaching critical thinking skills. They were found to agree strongly that critical thinking engages students’ higher order thinking and supports them to implement critical thinking in their courses. They also agreed that critical thinking would allow them to have a better understanding of course topics, achieve better learning outcomes and enjoy the learning process. This study also revealed that there is no significance either gender or age among pre-service teachers and there is, however, a significance between Certificate in Teacher Education students and Diploma in Teacher Education students. It means that Diploma in Teacher Education students have greater knowledge and better perception of critical thinking skills than Certificate in Teacher Education students.

In accordance with this study, it is recommended that teacher education programmes need to incorporate specialized techniques to develop critical thinking skills among pre-service teachers. Teacher education programmes should support pre-service teachers to be fully aware of critical thinking skills and have best strategies to teach their pupils later in the classrooms. Further studies are required to explore teacher education educators' critical knowledge and perception about critical thinking skills.

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