



Exploration of Critical Thinking of Trainee Students at Regional Teacher Training Center in Takeo Province, Cambodia

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Abstract

The purposes of this research were to: (1) examine and evaluate critical thinking of trainee students at the Regional Teacher Training Center (RTTC) in Takeo province, Cambodia and (2) identify whether the demographic factors had related to trainee students' critical thinking. An exploratory research was employed in this study, and the Watson-Glaser Critical Thinking Appraisal (WGCTA) was used to collect the data. 101 trainee students in year I who had been being trained at RTTC for the academic year of 2013–2014 were selected as sample size and randomized by using Krejcie and Morgan table. Descriptive statistics (Mean and Standard Deviation), Pearson Correlation, and content analysis were used to analyze the data. The findings revealed that trainee students' critical thinking was generally at low level ($\bar{X} = 1.88$, S.D. = 0.24). Considering the mean score of each element from the highest to the lowest, the findings also indicated that the highest mean score was the interpretation subscale ($\bar{X} = 2.56$, S.D. = 0.67), respectively followed by deduction ($\bar{X} = 2.55$, S.D. = 0.58), evaluation of argument ($\bar{X} = 2.31$, S.D. = 0.54), recognition of assumption ($\bar{X} = 2.27$, S.D. = 0.53), and the lowest on inference ($\bar{X} = 1.01$, S.D. = 0.59). Concerning the demographic factors, the results indicated a majority of respondents was male (58.4%), most of them held associate degree (59.4%), and also was 21–25 years old (62.4%). Sex was statistically related to trainee students' critical thinking ($r = -0.23$), but age and education were not related.

These findings revealed herein lacking in preparation of trainee students for critical thinking skills considered as essential in daily's life and workplace. Regarding this matter, the existing curriculum, particularly teaching and learning environment was in needs for further strengthening so that critical thinking can be enhanced.

Keywords: Critical Thinking, Demographic Factors, Teacher Trainee Students

Introduction

A discussion of education in Cambodia must consider one of the fundamental factors limiting progress in education quality and teaching capacity, both at the individual and system levels. Quality training efforts might be beneficial in reorienting teachers to a more student-centered teaching approach. While the Ministry of Education, Youth and Sport (MoEYS) has developed specific goals towards eliminating unqualified teachers, their services are often still necessary. Cambodia currently suffers from a serious shortage of experienced and thoroughly

qualified teacher trainer in large part as a result of the disassembling of the teaching services.

At the first meeting of the Council of Ministers held in Phnom Penh on 26th September 2008, the Cambodian Prime Minister referred to 17 major challenges faced by the current government. Among these challenges, the quality of education at every level is of serious concern (UNESCO, 2010–2013). Although the review of education system in Cambodia shows that the state of education has greatly improved over the past two decades, reaching more and ensuring increased equal accessed to education regardless of the ethnic, socio-economic, or geographical backgrounds, the current education system has failed to lead to



employment and social mobility due to lack of participatory learning and especially critical thinking (UNESCO, 2011).

Education becomes a key to economic survival in the 21st century (Trilling and Fadel, 2009), and critical thinking has become something of a buzz word in educational circles (Fisher, 2001). Critical thinking is considered as the educational purpose which is required by every institute of education in order for young people to improve themselves and society. Critical thinking is “a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims, to discover and overcome personal prejudices and biases, to formulate and present convincing reasons in support of conclusions, and to make reasonable, intelligent decisions about what to believe and what to do” (Bassham, Irwin, Nardone, & Wallace, 2005).

As cited in Nelson et al., (1993, p. 160), critical thinking, defined by Ennis (1991, p. 6) as “reasonable reflective thinking that is focused on deciding what to believe or do”. Active engagement in the reflective act and goes well beyond the mechanical recitation of information imparted by educators or printed text is considered as core of critical thinking. Critical thinking requires learners’ involvement and real learning situations in which their participation, interests, motivations must be stimulated and cannot be ignored.

Critical thinking is considered as reflective thought which is defined as active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends (Dewey, 1909). Unlike passive process which is only receiving ideas and information from other sources, active process is thinking through raising questions or finding relevant information. Persistent and careful consideration

is about giving and evaluating reasoning. Relatively, a reflexive thought is consecutive, not merely a sequence, and reflection involves not simply a sequence of ideas but a consequence—a consecutive ordering” (Dewey, 1910, p. 2).

Critical thinking requires both inductive and deductive reasoning. The inductive reasoning refers to the movement toward building up new ideas through using the premises in seeking to supply a strong evidence for the truth of the conclusion whereas deductive reasoning deals with the movement toward developing, applying, confirming, modifying, refuting, and testing on the base of its capacity to interpret isolated details into a unified experience (Dewey, 1910).

In recent years, the trend of education has changed from teaching information and content to being interested in teaching thinking skills of various kinds. In this essence, critical thinking is that mode of thinking about any subject, content, or problem in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them (Paul, Fisher, & Nosich, 1993).

Critical thinking enables students to define and resolve problems, change focus, consider alternatives, and define strategies (Lee, 2005), and this indicates that it is intended for benefits in the classroom, workplace, and daily life (Bassham et al., 2005). Critical thinking in the classroom helps students learn a variety of skills including understanding the arguments and beliefs of others, critically evaluating the arguments and beliefs, and developing and defending their own well-supported arguments and beliefs. Critical thinking in the workplace can help workers solve the problem effectively, think creatively, gather and analyze the information, draw appropriate conclusions from data, and communicate ideas



effectively and clearly and particularly avoid making foolish personal decisions. Critical thinking in life can help people make decisions more carefully, clearly, and logically, free from unexamined assumptions and biases, and especially promoting democracy (Bassham et al., 2005).

Critical thinking is best taught in the context of individual subjects such as mathematics, physics, or critical reading skills, and students are able to apply it in their daily's lives. Reasonable reflective thinking and arguments or criteria for verifying truth and credibility from one subject may be quite different from another. According to Nitko (2004), critical thinking abilities of the students are grouped into five areas including (1) elementary clarification-focusing on a question, analyzing arguments, and asking and answering questions that clarify and change, (2) basic support-judging the credibility of a source, making and judging observations, (3) inference-making and judging deductions, inductions, and value judgment, (4) advanced clarification-defining terms and judging definitions and identifying assumptions, (5) strategies and tactics-deciding on action and interacting with others.

Demographic factor includes age, race, sex, economic status, education, income or employment (Lin, 2009). Certain demographic factors such as age, gender, or employment also have an impact on critical thinking abilities, and these factors were studied and correlated with the learners' thinking and academic success (Facione, 1990; Jones & Watson, 1990; Rood, 1987).

According to the research "The Critical Thinking Skills of Teacher Candidates Turkish Republic of Northern Cyprus Sampling" conducted by Serin (2013), the findings revealed that first-year candidates' critical thinking skills are at a very low level, and critical thinking skills increase as candidates

progress in upper classes and semesters. More importantly, female teacher candidates' critical thinking skills are at a high level than those of male teacher candidates. Additionally, the research "Halpern Critical Thinking Assessment Predicts Real-World Outcomes of Critical Thinking" conducted by Butler (2012), the result found that those with higher critical thinking scores reported fewer negative life events than those with lower critical thinking scores. Critical thinking is low among students or even university students (Halpern, 1998; Kuhn, 1999), and considered to be assessed and enhanced.

Lipman (1984) believes that improving critical thinking skills in education will improve education altogether by increasing a student's quantity and quality of meaning from what a student reads, perceived and in expressing what he/she says and writes. Kokdemir (2003) found that female students have a higher disposition for critical thinking compared to male students. Similarly, Genc (2008) studied critical thinking tendencies among teachers. The results indicated that tendencies differ in sub-scale on open-mindedness and curiosity with regard to gender.

Relatively, a research conducted by Schwabel (1975) about the formal operations ability, the results found that most students seem to be lacking critical thinking skills, regarding of background experience. This reflects that different backgrounds or exposures of education and environment might relate to critical thinking. It also uncovers that student's ability to use or apply information seems quite limited. Since formal operations have been defined as being synonymous with critical thinking, the need to develop this stage in students is vital.

Also, the standardized test was offered to measure key college student learning outcomes concerning critical thinking and writing of entry-level college freshmen, the results found that 89% of college



freshmen in 2006 were not proficient in critical thinking (Association of American College & Universities, 2007). Also, the college faculty reported that the first-year college students principally are required to develop problem-solving and critical thinking skills (Lundell, Higbee, Hipp, & Copeland, 2005). Kuhn (1999) studied critical thinking and stated that there is a need for improvement in critical thinking among students since many fail to use sophisticated reasoning skills even at the college level. In higher education, critical thinking can be displayed through student's mastery of intellectual skills and abilities, but teaching and evaluation of critical thinking in the current college classrooms and curricula is insufficient (Gupta, 2005).

Concerning this matter and its necessity, this research study will be conducted to examine, investigate, and evaluate critical thinking of trainee students at the Regional Teacher Training Center in Takeo province, Cambodia.

Research Objective

The purposes of this research were:

1. To examine and evaluate critical thinking of trainee students at the Regional Teacher Training Center (RTTC) in Takeo province, Cambodia
2. To identify whether the demographic factors including sex, age, and level of education had related to trainee students' critical thinking

Method

Research Participants

This exploratory research was conducted at the Regional Teacher Training Center (RTTC) in Takeo province, Cambodia. The data was collected from 101 trainee students who had been being trained in year I for the academic year of 2013–2014.

Research Instruments

The Watson–Glaser Critical Thinking Appraisal (WGCTA) was employed to collect the data from the targeted participants, and also used as a means of representing a valid estimate of the proficiency of the individual trainee students with respect to their critical thinking ability (Watson & Glaser, 1980). Concerning this appraisal, the researcher asked for permission from the author of this instrument and received consent to officially and legally use it (See the attached consent confirmation, dated 11th June, 2014). The instrument comprises a series of objective items divided into five sections including inferences, recognition of assumptions, deductions, interpreting information, and evaluation of arguments with a total of 86 items. Also, the researcher added a demographic form which is a checklist composed of sex, age and level of education in order to collect more information from the participants.

Research Procedures

The data gathering was conducted from the 01st – 30th July 2014. Prior to data collection, the researcher communicated with the director of RTTC in Takeo province via phone call to seek for permission and cooperation to get accessed to collect the data. It was informed to the director of the training center that only year I trainee students for the academic year of 2013–2014 were voluntarily asked to do the test. The permission letter was received two weeks later with the co-signed by the direct of RTTC and head of Provincial Office of Education.

Data Analysis

Following the answer key provided in Watson–Glaser Critical Thinking Appraisal (WGCTA), the completed tests were scored per subset and totaled by the researcher, based on the directions stated in the instrument's manual, and then entered into the computer software using statistical program for social research.

Descriptive statistics (Mean and Standard Deviation) were used to give the overall information about the demographic factors and to examine critical thinking, Pearson Product Moment Correlation was used to identify the correlation between demographic factors and critical thinking, and the content analysis was critically used to analyze the findings received from the participants.

Results and Discussion

As explained earlier, the purposes of this study were (1) to examine and evaluate critical thinking of trainee students at RTTC in Takeo province and (2) to identify whether the demographic factors had related to trainee students' critical thinking. The results of descriptive statistics, Pearson Product Moment

Correlation, and content analysis were presented as follows:

General Information about Demographic Factors

The results of data analysis indicated that a majority of respondents was male, the age group 21–25 made up the largest respondents, and most of them held associate degree (See figure 1 below). This emphasizes that student trainees who have been being trained at RTTC in Takeo province are young at their own ages and experiences. Most of them have just passed their diploma degree for which it is required to take at least 18–20 years to successfully complete this state-owned general course (the school age which is officially recognized and accepted to start class is 6 years old onwards and might take 12 years or more to successfully complete the general course).

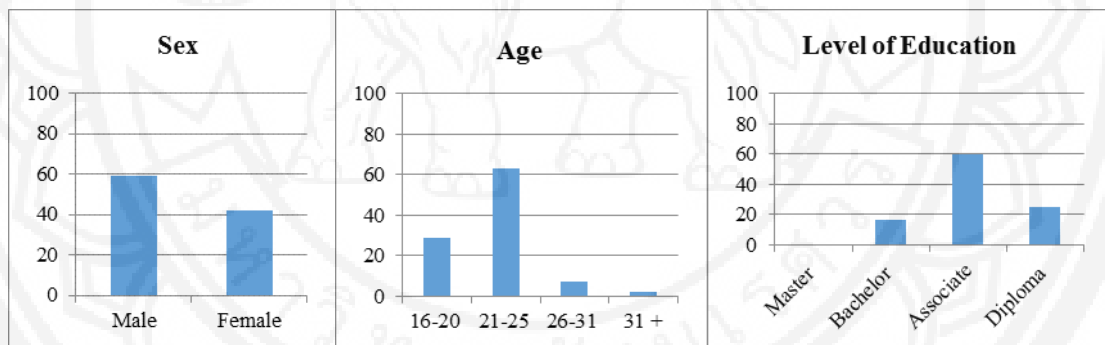


Figure 1 Analysis of Demographic Factors Using Descriptive Statistics

Critical Thinking Appraisal

The concept of critical thinking was found about hundred years ago as a result of lack of critical thinking (Jowett, 2009) and counted as one of learning and innovation skills considered as compulsory in the 21st century (Greenstein, 2012, p. 22). Concerning this study, the findings of data

analysis revealed that critical thinking of trainee students who have been being trained at RTTC was generally at low level. Regarding each subset, the results also indicated that the highest mean score was interpretation, respectively followed by deduction, argument, assumption, and inferences (See figure 2 below).

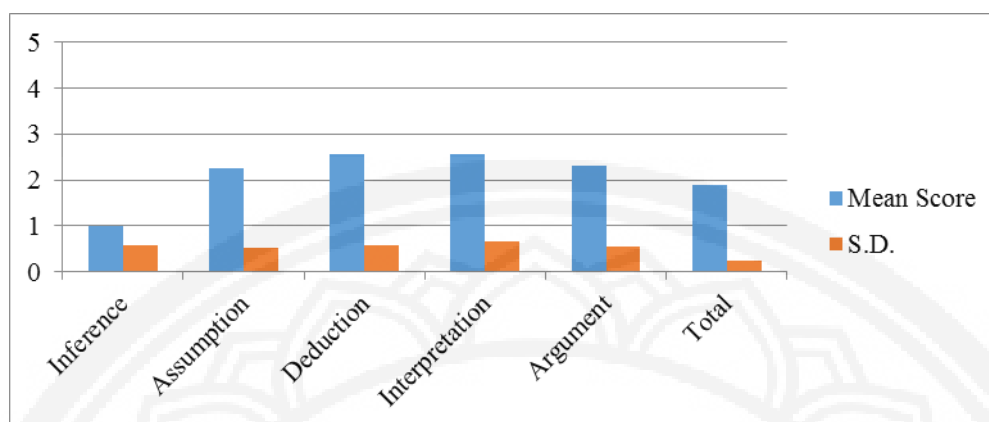


Figure 2 Analysis of Critical Thinking Using Descriptive Statistics

Note: The level of data interpretation: 4.21–5.00: Highest; 3.41–4.20: High; 2.61–3.40: Medium; 1.81–2.60, and the Low, and 1.00–1.80: Lowest (Best, 1970)

The same results also reflected in the research “A Preliminary Investigation into Critical Thinking of In-Service and Pre-Service Middle School Chemistry Teachers in Shaanxi province of China” conducted by Zhou, Yan, Zhao, Liu, and Xing, (2012). The results found that teachers’ dispositions towards critical thinking are at an average level while their scores of critical thinking were very low. Also, similar results were found in the research “Identifying Faculty’s Knowledge of Critical Thinking Concepts and Perceptions of Critical Thinking Instruction in Higher Education” done by Stedman and Adams (2012). The findings found that faculty’s knowledge of perceptions and concepts of critical thinking is severely lacking.

The consequence of low level of student trainees’ critical thinking comes from many reasons as follows:

Most of students have just completed their general course at high school; therefore, they might have less experience in life, particularly in identifying alternatives, clear sources, relevant data, and or reasons used to support their thinking. As stated by Salpeter (2003) students need to move beyond knowledge-level course content; they need to know

how to apply their knowledge and skills, demonstrating critical thinking in new situations by analyzing information, comprehending new ideas, communicating, collaborating, solving problems, and making decisions.

Trainee students have less exposure to critical thinking environment. The educational system in Cambodia begins with a scratch hand after a drastic civil war lagged to its groundless development in 1975. A philosophy of “who knows more teaches who know less” was implemented in the nationwide. Although the education adopted student-centered approach for the past several years, most of teaching instruction still follows a rule of thumb, teachers act as donators whereas students work as listeners. For instance, the individual work more than group work was extensively performed, individual opinion was not really encouraged or motivated during the class, only printed-text books were widely used, and real life-based learning activity was rarely introduced. These are inconsistent with the results of some recent researches that emphasize developing student competency to deal with complex problems in real-life contexts (Chinn & Malhotra, 2001) and the



needs to support students to effectively function in complex problem-solving environment (Roth, 1995) require students to be involved in critical thinking which underlies a process of purposeful, reasonable, and goal-directed higher-order thinking (Halpern, 1999).

Insufficient teaching and learning materials are considered as crucial factors affecting trainee students' critical thinking. Training materials including posters, internet access, collage, newly-updated text books, and some other supportive documents are still limited. As cited in a research done by Snyder and Snyder (2008), there are four barriers which impede the integration of critical thinking in education include (1) lack of training, (2) lack of information, (3) perceptions, and (4) time constraints. Tantamount with this consequence, the findings of research "Factors Influencing Teaching Skills of Urban Primary School Teachers in Cambodia" conducted by Sitha (2002) found that instructional materials are significantly related to teaching.

The limitation of knowledge and perceptions concerns critical thinking instruction. Both trainers and trainees have less opportunity to update their existent capability related to how to improve their critical thinking. The absence of curriculum to improve critical thinking is presented from the bottom line, training and learning follow the guidelines

organized by the concerned parties, training focuses on quantity to fulfill the incumbent needs rather than quality, and motivation and encouragement are less performed. In a research "Perceptions of the Use of Critical thinking Teaching Methods" done by Kowalczyk, Hackworth, and Smith (2012), the results also found that lack of appropriate instructional materials, lack of knowledge of how to promote students' critical thinking skills, lack of administrative support in developing new teaching methods, and lack of students motivation to become critical thinking are obstacles to improve critical thinking.

The Relationships between Demographic Factors and Critical Thinking

Certain demographic factors such as age, gender, or employment also have an impact on critical thinking abilities (Facione, 1990; Jones, & Watson, 1990; Rood, 1987). Concerning this research study, demographic factors include only sex, age, and education. The results of data analysis indicated that age and education were not significantly related to critical thinking; however, sex was negatively related to critical thinking. In lieu of each subset of critical thinking, the findings also yielded that only recognition of assumption was negatively related to gender, but the other variables were not (See table 1 below).

**Table 1** Analysis of Relationships Using Pearson Correlation

The Elements of CT	Demographic Factors		
	Sex	Age	Education
Inference	-0.13	-0.07	0.09
Recognition of Assumption	-0.29**	0.09	0.18
Deduction	-0.11	0.07	0.15
Interpretation	0.22	-0.07	0.03
Evaluation of Argument	-0.09	0.84	-0.04
Total	-0.23*	0.67	0.15

**Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

There are several reasons which reflect that age and education are not significantly related to critical thinking, but gender is negatively related to critical thinking. Even though trainee students are at different ages and levels of education, there is no difference noticed during learning and teaching instruction. Some obstacles were identified including lack of appropriate instructional materials, lack of knowledge of what constitutes critical thinking, lack of training, learning for the test rather than the content, lack of information, time constraints, and particularly a large amount of information to cover the content. Noticeably, learning is not really related to the individual learners' needs or real life-based activities, but directly followed by the guidelines set by the concerned organization. As a consequence, there is no difference in critical thinking related to age and level of education of trainee students.

There are some previous researches showing the same results. The findings of research "Assessment of Critical Thinking Skills Among Undergraduate Athletic Training Students" done by German (2008) with the purpose of providing information regarding critical thinking skills of undergraduate athletic training students and sample size of 78 undergraduate athletic training students found that there was no significant difference between academic level and

critical thinking score. Gross, Takazawa, and Rose (1987) used the WGCTA to examine the correlation of two predictors including age and years of education after high school. The results indicated that age and years of education were not statistically correlated to critical thinking.

Sex was negatively related to critical thinking. This comes from several reasons. Male students have more exposure to both learning environment and social interaction than female students. Also, male students are more active than females during learning. Male students dare to ask questions, work in groups, or share ideas more than females do. This behavior leads to different levels of critical thinking between male and female students. The same results reflected in the research conducted by Howenstein, Bilodeau, and Brogna (1996), employing a cross-sectional survey to determine which factors were associated with critical thinking skills, using the WGCT with a sample of 152 clinical nurses. The results revealed that age and years of experience were negatively correlated critical thinking. Similarly and Kokdemir (2003) found that female students have a higher disposition for critical thinking compared to male students



Conclusion

There are 6 Regional Teacher Training Centers (RTTC) in Cambodia. Students who pass their placement test and meet all the requirements administered by RTTC will be trained for two years (Pedagogical training and practicum). After successfully completing a 2-year training program, all trainee students will be officially registered as government secondary teachers and deployed to schools where they have applied.

The Regional Teacher Training Center (RTTC) in Takeo province which is situated in III village, Rokaknong commune, Daunkeo district, Takeo province was found in 1981. The statistics reported by the Ministry of Education, Youth, and Sport and UNESCO pointed out that the quality of teacher training is still limited, and needed more improvement, especially trainee students' critical thinking. The results of this research study indicated that male trainee students made up the largest respondents, and a majority of them was 21–25 years old and held associate degree.

There are a number of reasons led to low critical thinking of trainee students, and these are including inadequate computers or laboratories, lack of opportunity for further training, limited effectiveness of resources due to less coordination among teacher training programs, teaching methods which are critically considered developing critical and creative thinking abilities are less understood and performed in the classrooms, the current curriculum which does not particularly meet the emerging requirements, insufficient and obsolete training materials, achieving results rather strengthening capacity, less focusing on individual trainees' needs, and lack of participation in curriculum development. However, there are other

variables other than those included in this study affecting trainee students' critical thinking.

The current study emphasizes on sex, age and education as its demographic factors. Age and education are not significantly related to critical thinking, but sex is negatively related to critical thinking. The divergence of age and education do not emanate any effect on trainee students' critical thinking due to teaching and learning environment, but males and females have different levels of thinking because of their exposures and class interactions.

The result of this study could provide some implications on how to enhance trainee students' critical thinking at RTTC. Some crucial factors should be reconsidered by the concerned parties. For instance, learning should be extensively associated with students' needs and their real life, students' motivation and encouragement should be enhanced, different activities and techniques should widely used during the class, cooperation and teamwork should be enhanced, various resources use should be applied, and quality should be highly focused.

If these factors are extensively implemented, critical thinking of trainee students will be enhanced, and vision of the Ministry of Education, Youth, and Sport in establishing and developing human resources of the very highest quality and ethics in order to develop a knowledge-based society within Cambodia will be met.

Implications

The result of this study could provide some implications on how to enhance trainee students' critical thinking at RTTC. There should be reconsidered of teaching and learning environment. Lessons should emphasize real-life problem solving, trainee students should be taught how to identify the



problems or issues that they wish to explore, trainee students should be given freedom and responsibility to explore the content, analyze resources, and apply information, stimulating recall of prior learning should be strengthened, class should be covered by a plenty of presentations, debates, and flora, instructional strategies should actively engage students in the learning rather than solely on the content, and trainee students should be taught how to think instead of what to think. Furthermore, the concerned parties should also reconsider of the existing curriculum so that these barriers can be improved, and trainee students' critical thinking can be enhanced.

Recommendation

Operational Recommendation

Some suggestions were recommended in light of improving critical thinking.

1. Trainee students should be given freedom and responsibility to explore the content, analyze resources, and apply information.
2. There should be appropriate and sufficient instructional materials, a variety of presentations, debates, and especially good interactions between students and trainers.
3. Problem-solving, discovery learning activities, and real-life based learning should be highly used.

Research Recommendation

Based on the results of this study, some recommendations for future research can be made.

1. Due to this research study only focused on trainee students at the Regional Teacher Training Center in Takeo province, there should be another research conducted at other training centers.
2. This research employed quantitative approach and Watson-Glaser Critical Thinking Appraisal (WGCTA); hence, there should be a further research

using different assessment tools and methods such as qualitative or mixed approaches.

3. The demographic factors consisted of age, sex, and education included this study; however, there might be a research conducted adding or using more other variables.

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