Relationship between B.Ed (Hons) Elementary Prospective Teachers' Critical and Reflective Thinking Skills

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Abstract

This study aimed to determine the relationship between B. Ed (Hons.) Elementary prospective teachers' critical thinking and reflective thinking skills. In the learning process, developing higher-order thinking skills (HOTS) was imperative. Critical thinking stresses the skills to acquire information, which include comparing and in-depth evaluating and utilizing that information to solve a problem, which are among the most important. On the other hand, reflective thinking is related to the constructivist approach. It enables people (or students) to feel accountable for their learning, select their learning goals, and actively participate in learning processes. This study adopted a quasi-experimental design with an intact group of participants. The researchers developed lesson plans and achievement tests to measure critical thinking skills. The researchers also developed a 5-point observation scale to measure reflective thinking skills. For the data analysis, a correlation was run to evaluate the relationship between the dependent variables: critical thinking and reflective thinking skills. There was a strong positive correlation between critical thinking skills and reflective thinking skills of prospective teachers. A recommendation by the researchers was to use reflective practices in the classroom to increase future teachers' critical thinking and reflective thinking abilities. This would allow for more excellent performance from the prospective teachers.

Keywords: Reflective Practices, Critical Thinking Skills, Reflective Thinking Skill.

Introduction

The competencies required by the workforce are evolving. In this context, individuals must assimilate new knowledge, address challenges through problem-solving, and utilize information to create new insights. Individuals must evaluate the available data, which should be integral to the analytical process. Such activities undoubtedly necessitate advanced cognitive abilities. Individuals must possess critical, analytical, creative, and reflective thinking skills, particularly concerning higher-order thinking skills (Amjad et al., 2024, a, b, c, d; Cui & Teo, 2023; Guo & Lee, 2023; Kurt, 2018).

Among the skills required for the twenty-first century is critical thinking. The development of critical thinking skills, which is the ultimate goal, should be given greater attention in this century's educational system (Binkley et al., 2012). This may be used as a guiding feature by students skilled in critical thinking to assist them in solving challenges. Critical thinking skills, which are taught

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as a component of higher-order thinking skills, will make students more equipped to handle problems and difficulties in daily life (Saido et al., 2018). Conversely, reflective thinking is associated with the constructivist methodology and empowers individuals (or students) to take ownership of their education, choose their learning objectives, and actively engage in the educational process (Amjad et al., 2023; Demiralp & Kazu, 2012; Ong et al., 2024).

Critical thinking and reflective thinking play a significant role in the domain of teacher education. The rationale for this is that if student teachers are nurtured to be inquisitive and analytical individuals, they will be capable of fostering classroom settings that cultivate the critical thinking (CT) and reflective thinking (RT) skills of their students in their respective classrooms (Habib et al., 2024, a; Rott & Leuders, 2017; Williams, 2005). Therefore, it is crucial to assess the proficiency of student teachers in critical thinking (CT) and reflective thinking (RT) skills and explore the correlation between these two skills.

Reflective teaching is crucial for the professional development of both pre-service and in-service teachers. However, there is a lack of research in Pakistan that explicitly focuses on the reflective teaching practices of prospective teachers. Previous studies conducted in Pakistan on this topic include those by Ahmad et al. (2013), Iqbal (2017), Iqbal et al. (2016), Noureen et al. (2020), and Zahid & Khanam (2019). Engaging in reflective practices and developing critical thinking (CT) and reflective thinking (RT) skills to improve a teacher's professional competence while performing the duties of the teaching profession. Reflection allows the teacher to analyze their personal experiences in the teaching-learning process and the influence of the organizational structure they are a part of in the teaching-learning process (Şener & Mede, 2023).

Literature Review

Critical Thinking

An ancient Greek philosopher, Socrates is regarded as the father of critical thinking. Socrates developed a method to probe the answerability of opinions (Paul, 1997). Socrates de-emphasised the role of authority, arguing that those in a position of power might also be wrong, and developed a process designed for examining/evaluating ideas in order to validate or invalidate them. The Socratic style of questioning that persist even today continue to help students think critically by provoking the students to question their own assumptions, hypotheses or belief (Paul, 1994). Socrates was the teacher of both Plato and Aristotle. In his treatise Theaetetus, Plato elaborates on reflective thinking, which he defines as critical reasoning through introspection. As Aristotle said: "It is the mark of an educated mind to be able to entertain a thought without accepting it" (Amin et al., 2024; Malik et al., 2024; McKeon, 1953). The medieval thinker Thomas Aquinas promoted that it is pivotal that one be aware of their own reasoning and that one's reasoning should mould over time, and through contemplation. The philosopher, Francis Bacon (1605), encouraged all of us to avoid "allowing our thoughts (our ideas) to roam free" for fear of falling into poor reasoning patterns and false beliefs (Paul, 1987). Over the long term, this would help someone develop the intellectual habits and dispositions of mind that constitute critical thinking. Moreover, the scientific method also as we recognize today was first proposed in academia by Francis Bacon. Fifty years later, René Descartes described the process as one in which each aspect of thought is found to be questionable, which is assumed to be false until proven true in the fashion of a scientific process, to discipline the mind into good thought (Anderson et al., 2010).

John Dewey, the 20th-century educator, and philosopher who had a foundational role in theories still forming the basis of education. He stressed that learning is best done through active exploration, experimentation, and practice, and he insisted that education should involve more than

just learning by heart. In Dewey's view, critical analysis is essential to the independent judgment, and passive acceptance delivers nothing but complacency. His principles provided the basis for progressive education, a system where students are encouraged to question, discover, and explore their learning. Truth, as Dewey claimed, belongs in the realm of genuine knowledge, which arises from interaction with the environment but also continuous encounter with our line of thought and the beliefs that we presume. His philosophy of education and mode of thought are still relevant today and are most likely referenced in discussions of critical thinking and pedagogy.

Critical Thinking was gradually systematized and expanded by John Dewey in the early twentieth century, who called it reflective thinking. As Dewey himself defines reflective thought, "The active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (Dewey, 1910, p.6). The subject matter of the article is revealed: Dewey thinks (thus he writes) that beliefs should be based on solid body of reasoning. Knowledge without reflection knows not its own ignorance and becomes a devil's curse, he said. Though concept of reflective thinking has a larger purpose which is to break the bias of thinking that what one sees is real and true as one cannot see anything directly except physical objects (Han & Wang, 2021).

The original Bloom's taxonomy included critical thinking in its domain back in 1956. In this Robert Ennis, who has continued the work of John Dewey and Barbara Glaser the first two references we found on critical thinking for Ennis critical thinking and what to belief of do decision making to critically think is to decide with the trust what to believe or do would be the goal of critical thinking (Chen et al., 2019). And he spoke of the need to allow students to think rationally when they do so reflectively. In the late 1980s, the American Philosophical Association commissioned Peter Facione to review the research on critical thinking as it relates to specific domains of critical thinking ability, instruction, and assessment. His work was an attempt to clarify the terms that establish an effective framework for the understanding and teaching of critical thinking. This effort was aimed at determining a consensus regarding the key components of critical thinking and what systematic approach might be taken to teach its components. In 1987 he summoned a council of 46 members who reached consensus on what constituted critical thinking: "Critical thinking is a judicious, self-regulatory judgment the product of which is interpretation, analysis, evaluation, and inference, as well as the explanation of the evidential, conceptual, methodological, criterion, or contextual considerations upon which that judgment is based" (Mastuti et al., 2022). Elder and Paul (2007) developed this approach to critical thinking during the early 2000s, and it consists of elements of thought (i.e., parts of the critical thinking process) and channels of disposition (i.e., associated ways of thinking that can be included to optimize critical thinking capacity) (Elder & Paul, 2009).

Critical Thinking and Teaching English Language

A predominant theme in contemporary educational reform is critical thinking. The importance of critical thinking in education, especially in higher education, is now recognized by many educators. Critical thinking is one of the most popular ideas in modern educational reform. Many teachers now agree that critical thinking is crucial in the classroom, especially at the university level. Teaching students "how to think" is just as important as teaching them "what to think" (Lee et al., 2024). A fundamental aspect of this objective is the development of critical thinking skills, regarded as essential in the 21st Century (Liang & Fung, 2021). Critical thinking, though conceptually ancient, has been underscored by philosophers such as Socrates and Aristotle, who highlighted the significance of inquiry, reasoning, and the pursuit of truth (Yuan et al., 2022). This

perspective on the learning process must be integrated into the core of contemporary education. However, in the modern era, critical thought increasingly adopted a structured educational objective, particularly with the emergence of the scientific method and Enlightenment philosophy (Adams, 2020). With the expansion and diversification of higher education over the 20th century, critical thinking became more prominent in the curriculum (Rivas et al., 2022). The imperative of cultivating critical thinking abilities is particularly emphasised in the contemporary era, characterised by an abundance of information and the rapid dissemination of knowledge via digital platforms (Rossi et al., 2022). The lack of critical thinking abilities results in quantifiable repercussions throughout all areas of life, affecting educational achievement, meaningful work, and civic engagement (Adams, 2020; Afzal et al., 2023).

Tarmizi et al. (2022) asserts that the concept of critical thinking has influenced second language (SLL) instruction. According to him, language educators should exercise caution on its pertinence to the profession, and he expresses skepticism about its genuineness. He presents four arguments in favor of this hypothesis:

1. Critical thinking is predominantly an implicit social practice rather than a distinctly defined and teachable set of behaviors.
2. Critical thinking has been criticism for its propensity to be exclusive and reductionist.
3. Teaching critical thinking to native speakers is already challenging, and cultural differences make it even harder for second language learners.
4. Moreover, once cognitive skills are imparted, they appear to lack effective transfer outside the particular situations in which they were acquired.

This means that even if you want to make a case against critical thinking, you have to first believe it is true, which means you have to be a critical thinker. Chagalakonda (2024) said that the issue for education is not whether critical thinking is useful for people from non-western cultures, but how and when to use critical thinking. This is what Liang and Fung (2021) says about the cultural load of critical thinking. Teachers of English as a foreign language have a responsibility to help their students become comfortable communicating with native speakers who place a premium on direct questioning, insightful commentary, and bold claims. L2 educators, may be even more so than L1 educators, have a responsibility to help their advanced pupils develop their critical thinking skills. If we don't, our pupils will have a much harder time thriving in environments that need them to think critically, such as schools.

With the abundance of research suggesting that critical thinking can be taught, the main concern is how to effectively include a critical thinking-focused education and the specific responsibilities and qualifications that language instructors should have in this process (Dekker, 2020; Bellaera et al., 2021). Alsaleh (2020) highlights the capacity of teachers to engage in critical thinking and teaching. Calderhead (2021) argue that educators should possess a well-defined understanding of critical thinking prior to engaging in teaching and assessment.

Thornhill-Miller et al. (2023) examines the educational challenges posed by the future of work, focusing on the conception, assessment, and improvement of "21st century skills." It specifically highlights the fundamental soft skill competencies known as the “4Cs”: creativity, critical thinking, collaboration, and communication. Essential qualities include creative and analytical thinking, adeptness in collaborative working, ability to function across borders, and resilience. Fundamental characteristics of mindset include audacity, fervor, dedication, optimism, receptiveness, perseverance, and flexibility. These notions should enhance the ability of future learners to formulate solutions that will benefit the environment, biodiversity, and humanity. It

will be the future generation's job to tackle environmental concerns; therefore, ensuring their fitness for this task is essential.

Reflective Thinking

Reflective thinking is an essential aspect of teacher development for improving teaching practices. It urges teachers to reflect on experiences, question their assumptions, and make thoughtful decisions around self-improvement. Renowned philosopher John Dewey (1933) called it one of the modes of thought: active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends (p.7). Reflective thinking as a subject of teacher-education literature (Schön, 1987). Reflective thinking is an exceedingly well-known construct in teacher education, one that accompanies dozens of other forms of thinking, metacognitive, critical, analytical, and creative. This approach is titled as thinking during process of education (Gurol, 2011). The only difference of reflective thinking from all other thinking types refers to its acting as a solution interpretation, solution deferment, translation, arrogation to individual, illusion of the band concept for solutions predestination, comprehension of the issues in school considered in anticipation of understanding and making predictions for the future.

The objective of this study was to ascertain whether prospective teachers are employing reflective thinking in their learning processes. This is seen as a method to enhance cognitive abilities, especially in relation to critical thinking. This research aims to examine how prospective teachers perceive themselves and their teaching methods by analysing two components that may indicate the extent of their reflective thinking. This leads to the notion that reflective thinking will augment critical thinking (Dewey, 1933). It is an element of the critical thinking process focused on past behaviours, whether external or self-directed.

Five basic cognitive skills needed for reflective thinking were found by Dymoke and Harrison (2008), which are: observation, communication, judgement, decision-making, and teamwork. In fact the five competencies of reflective thinking represent essential professional skills which are not limited to specific levels of professional experience but that have application at all stages of teacher development such as that provided during initial teacher education. Interactive conversation diaries, meaningful conversations, and teaching portfolios all promote reflective thinking skills for educators (Cruickshank et al., 2006). Educators can use various tools to enhance reflective thinking, namely, audio, visual, and scribbles, (Dymoke & Harrison, 2008).

Teachers Reflective Thinking Skills

Observation, communication, judgement, decision making, and team working are five crucial cognitive abilities for reflective thinking. This section provides a comprehensive explanation of the reflective thinking abilities possessed by all educators.

Observation Skill

Observing is not just about looking; it is about watching with a purpose and interpreting what you see when you are teaching. This means that teachers need to be on alert looking for verbal and non-verbal signs in regards to face expressions, signs like body language, change in tone of voice to assess understanding and engagement from their students. Reflective observation is important as well, in which teachers look at data in which they can notice trends with students and growth over longer periods of time for students. Structured observation, checklists or rubrics can help you keep objectivity and consistency. They also create opportunities for collegiality, offering teachers

exposure to innovative teaching practices. When it comes to observation, technology makes it even more powerful: it allows teachers to record their lessons, and evaluate it later, allowing them to improve their practice. Post-observation reflection in which teachers engage in critical reflection on their teaching practices promotes professional growth. Integrating different observation methods including direct observation, description, electronic recording, and peer observation, helps teachers know the teacher environment better, and thus respond with a better competency. (Dymoke & Harrison, 2008).

Communication Skill

The reflection process, whether developing a personal learning journal, a professional diary, or an organised portfolio that may include formal mentoring sessions, is considered an effective means of developing communication skills (Dymoke & Harrison, 2008). It is a deliberate and wilful act (Schön, 1983, 1987, 1991) to think critically about practice. Yet, this process can be started by teachers if they ask open-ended questions about a given event in the lesson or within a critical incident. That might be written, as in written reflection or written portfolio; could be video recorded, or it could be in an audio log. Important guiding questions include: what have I been doing? What is my current approach? How effective is it? What does my teaching look like these days? What themes or trends can I notice? What challenges have emerged? What led up to that moment? So now that begs why this happened the way this happened? How did my choices affect student learning and participation? Teachers can also provide peer feedback, self-assessment checklists, and action plans to further hone their communication strategies. Repeated this practice leads educators to understand more about their own methods and the better they present their ideas, the more engaging these interactions become with students and colleagues alike.

Analytical Skill

As a teacher or a mean evaluator in classroom, event or whatever it may be, we should have the clarity of the parts involved. If the faculty members will be involved in the event or scenario as well, their perception should be bias-free. A description of the incident alone is sometimes enough. But if we look further into the context, the players, and the background, the understanding is richer in its detail. Teachers may necessarily distort parts of the event to suit their will, but they can also insert additional elucidation and thoughts to aide comprehension and purpose. The reflection should include student interaction, learning outcomes, and overall effectiveness. In addition, involving staff, students, or other stakeholders can enrich the evaluations. Honest feedback covering pluses and minuses provides an opportunity for true professionalism leading to better education practice. As I indicated before as a judge that best outweighs perfect (Dymoke & Harrison, 2008), but best cannot be an abstraction, or less still a constant, since best is context-dependent and perfection is too. Focusing on the most impactful and practical solutions allows teachers to streamline their approach and play a role in continuous improvement and learning.

Decision-making Skill

Decision-making is defined as the process of choosing one alternative from a number of alternatives, to achieve certain objectives. Considering also how fundamental decision-making is, teachers need to implement a variety of reflective practice strategies. These approaches give educators a richer perspective about the complexities of pedagogy and help them identify informed, thoughtful decisions about what to do next. Talking and analyzing the practice with some chosen peers through reflective practice tactics can help the teachers to get a better idea about

the strong and weak points of a lesson. Furthermore, self-assessment through journaling, video recordings of lessons and student feedback can enable a teacher to make better decisions. It also provides an opportunity to meet with other teachers in a professional learning community or a workshop to share ideas, develop approaches, and become familiar with the best practice. Reflective practice is important for teachers because it helps them to adapt to the varied dynamics of a classroom, boost student interaction and communication, and improve the overall success of the learning process.

Team Working Skill

Throughout their careers, educators will be placed within range of different groups, for example their subject/curriculum team, pastoral group, and cross-curricular topic teams on key ideas such as customized learning, assessment and feedback (Dymoke & Harrison, 2008). This collaborative team is designed to support professional development and teaching practice. Teachers also took part in professional learning communities (PLCs), collaborating and brainstorming ideas, strategies and solutions. For example, many districts offer mentorship programs that match a less experienced teacher with a more experienced one. Examples include co-teaching, collaborative practitioner inquiry, peer observations, lesson study, and action research. And together, the presence of technology (for example, virtual learning networks and shared digital platforms) enables continued collaboration and innovation of teaching practices.

Methodology

The present study was carried out to address the following research objective and null hypothesis:

Research Objective

1. To determine the relationship between critical thinking and reflective thinking skills of B. Ed (Hons.) elementary prospective teachers.

Null Hypothesis

Ho1: There is no significant relationship between critical thinking and reflective thinking skills of B. Ed (Hons.) elementary prospective teachers.

Methodology

Following the positivistic worldview, the researchers used a quantitative approach to investigate the phenomenon under study. In the current a quasi-experimental design that employed a time series design to determine the relationship between critical thinking (CT) and reflective thinking (RT) skills of B. Ed (Hons.) Elementary student teachers. The time series design involves repeated observations during a planned intervention to study the change process comprehensively. It tracks changes in experimental variables throughout the program, making it valuable for long-term interventions. Reactivity issues are addressed by integrating measuring procedures into the setting. When a control group isn't feasible, time series serves as a quasi-experimental design. It's particularly useful when there are no control groups or when dependent observations are collected over time, such as in field studies or when dealing with single cases.

Participants

The population of the present study was prospective teachers of B. Ed (Hons) Elementary of a private sector university in district Lahore. The total enrollment of the B. Ed (Hons.) Elementary was 30. These student teachers were the population and sample of the study.

Intervention

In this experimental research, the researchers observed the relationship between B. Ed (Hons.) Elementary prospective teachers' critical thinking (CT) and reflective thinking (RT) skills through reflective practices. In this quasi-experimental design research, the subjects were taught with the help of reflective practices for 16 weeks. The teacher taught the English Language-IV (Prose and Translation) Program. During the intervention period, the researcher assessed prospective teachers through tests for changes in their critical thinking skills. Every two week, a test was conducted, and a total of 8 tests were assessed throughout the intervention. During the intervention, the researchers also collected the data on an observation scale to measure reflective thinking skills.

Instrument Development and Data Collection

Instrument 1

The researcher developed lesson plans, achievement tests to measure critical thinking skills. The tests were developed according to the course outline of the 'English Language IV (Prose and Translation) Program'. There were two tests in a month and eight in four months. The students of B. Ed (Hons.) Elementary of semester 2 were participated in the study as prospective teachers.

Instrument 2

The researcher developed a 5-point observation scale to measure reflective thinking skills. The researcher developed the observation scale according to Dymoke and Harrison (2008) who identified five essential cognitive skills for reflective thinking: observation, communication, judgement, decision making, and team working. The researcher added questions about reflective practices measured against a 5-point scale, i.e., 5-Always, 4-Mostly, 3-Sometimes, 2-Rarely, and 1-Never, to measure reflective thinking skills. There were two observations in a month and eight in four months and 16 weeks.

Data Collection

The data collection procedure was completed in four months. The subjects of the present study were prospective teachers at The University of Lahore. The researcher collected data through face-to-face interaction. In this quasi-experimental study, the researcher collected data using two instruments. The tests were given to student teachers after getting the required permission from the HOD Department of Education. All the participants in the present study were voluntary. Since the tests took approximately 30 minutes to complete, the researcher collected data through the tests after the intervention every 14 days for critical thinking skills. The second instrument was the observation scale for reflective thinking skills. Then an observation scale was used for reflective thinking skills during the intervention. The results of these tests were arranged based on the outcomes of the tests.

Data Analysis

Data analysis was conducted by means of statistical package for social sciences (SPSS 16th version). In this study we analysed two variable to see if participants were significantly related When looking for interesting dependencies in a dataset, correlation analysis is a common go-to approach. Such relationships indicate the importance of the attributes with respect to the target class which we want to predict. Thus, the Pearson correlation coefficient was applied to investigate the association among the dependent variables. The dependent variables of the study were critical

thinking (CT) and reflective thinking (RT) skills and it is explored these dependent variables had strong positive correlation.

Results

The data was collected using eight measurements, and the researcher measured the correlation among the variables of the study. The results for the utility of skills are provided as under:

Table 1: Relationship between Critical thinking skills and reflective skills of prospective teachers

Variables	Mean	SD	CT	RS
CT	71.52	21.466	1	.511*
				.013
RS	163.57	4.305	.511*	1
			.013	

*. Correlation is significant at the 0.05 level (2-tailed)

The above table indicated that there was a strong positive correlation between critical thinking skills and reflective skills of prospective teachers. Thus, the null hypothesis was rejected.

Conclusion

The relationship between critical thinking (CT) and reflective thinking (RT) skills of prospective elementary teachers in the B.Ed (Hons) program has been explored in this study. Spearman correlation analysis showed that CT and RT skills were strongly positively correlated (r = 0.88). Essentially, prospective teachers whom employed greater critical and reflective thinking were found more competent in these skills indicating that valuable CT and RT can improve thinking. In order to cultivate critical thinking and reflection at the same time, teacher education programs need to recognize the interconnectedness between the two and create training activities which support both. Reflection should be embedded in all aspects of teacher training, rather than as a concept that developed as an outlier or, as a method to develop critical thinking. In this sense it can be said that reflective activities are especially well related to classroom management practices and to considerations related to student engagement and curricular development. Reflective thinking is greatly dependent on critical thinking and thus, teacher education programs should integrate both intrinsic interdependent cognitive ability to solve in-classroom concerns and implement theoretical knowledge based on practice. One way to facilitate this discipline dialogue is through a reflective inquiry project where prospective teachers can analyze classroom experiences, and to what extent decision-making classroom challenges can be solved based on a mindset of deep examination of the discipline.

Meanwhile, Chi (2010) also stated that teaching, a reflective practice, could increase the psychologists' ability in controlling situations of instability and conflict as well as some of the critical thinking aspects, which are confirmed by this recent study. Thus, teachers were better able to handle issues relating to instability and conflict by employing a reflective curriculum. It is indeed as reflection enhances the ability to solve of the teachers which is one of the aspects of thinking. Moreover, problem-solving activity has been demonstrated to be extremely critical in thinking. During the reflection process, we also refined some of the issues specifically related to instruction. If with the instruction the learners are critical on issues of how it was done, one can

say he or she has built on the problem-solving skills of the learners. If used properly, the students should be able to reason out calmly on how the teaching was ineffective.

Findings of this study echoed the recent work of Junsay (2016) who experimentally compared two very different approaches to student teacher education with one group being exposed to teacher-centred traditional learning such as lectures, and another being engaged in a reflective approach. Results of the study indicated that it seems critical-thinking skills of pre-service teachers were developed very well with the model and gave more evidence about the association between the reflection and critical thinking which is discussed in this study. Thus the research backs the claim of the interdependence of reflection and thinking in proposing that practice which involves students in reflective practice in turn develops their critical thinking skills.

The findings of the present study confirm the findings of Aktaş (2016) who found a significant correlation between students' reflective thinking dispositions and perceptions of self–efficacy in critical reading: the relationship was highly significant. This study proves that students who think reflectively are more confident of their capabilities of reading critically and thinking in an analytic manner (which is basically what is being done during reflective thinking and ensures that the readers think deeper). In this regard, Meral and Semerci (2009) research also stated that in their study, they discovered the "powerful correlations" between several sub-skills of reflective thinking and critical thinking. So, as we develop on certain specific sub-skills, which works on other sub-skills as well.

The results of the current study are consistent with the results of (Ghanidzeh, 2017) This research suggesting self-monitoring also influences the cultivation of reflective thinking; reflective thinking is coined with critical and critical reflection. Thus, it makes perfect sense that self-monitoring is one of the devices that is capable of helping students develop critical thinking because critical reflection not only requires students to evaluate their actions and behaviors, but also requires them to actively monitor their thoughts. This research discusses evidence from the research that reflection and critical reflection improve critical thinking, thereby further linking these two cognitive skills.

Education in the modern period must focus on developing critical thinkers who can use higher order thinking in novel ways. The data shows that instructors who don't know much about critical thinking aren't going to be able to help their students think critically in the classroom. In light of this new reality, it is the duty of teacher preparation programs to foster the development of critical thinkers within their student bodies.

Given that critical thinking is a talent that can be acquired via learning, it is imperative to modify current methods in order to provide adequate training for future educators. The curriculum must prioritize the integration of critical thinking into the courses it offers. In addition, teacher educators should include critical thinking tools into their teaching methods. It is crucial to familiarize educators with the concepts of critical thinking and provide them with strategies to cultivate critical thinking skills in their pupils. In order to achieve this objective, it is necessary to provide specialized training sessions both inside and outside the institutions.

To include critical thinking into education, instructors must be adaptable in making decisions to achieve goals by adjusting material, tactics, procedures, and assessment methodologies. They possess the authority to make decisions and have the ability to think critically and reflectively, which enables them to have a transformative impact on their students' lives. The scenario necessitates individuals to engage in introspection rather than being open to new ideas. Teacher education programs must actively seek methods to cultivate these talents in aspiring teachers in order to align with the objectives of the 21st century (Raines, 2015).

Furthermore, it is essential to modify the assessment and evaluation methodologies used by teacher educators. Assessment procedures should actively inhibit the development of memory and mechanical learning. Credit should be awarded to students based on their ability to use critical thinking skills during exams. Essentially, all components of teacher education programs, including curriculum creation, assessment, and evaluation, should be intended to actively encourage and expedite the cultivation of critical thinking skills in aspiring teachers.
Based on the findings, it may be inferred that the teacher education program being examined is not properly fostering critical thinking abilities, which are a key educational goal in the 21st century. It is necessary to implement changes in our teaching and learning methods in order to reach the objectives stated on a worldwide scale. The courses should be meticulously crafted and delivered in a manner that encourages the development of advanced cognitive skills.
This study also serves as a first exploration into the cognitive processes of teachers' reflective thinking. In summary, teachers can enhance their reflective thinking skills, including observation, communication, teamwork, judgment, and decision making, through the use of various reflective thinking tools such as self-talk ,reflective learning journals, reflective writing exercises, critical reflections, lesson evaluations, observations and learner dialogues. In addition, instructors use reflective thinking skills throughout their instructional procedures to enhance their own reflective thinking skills.

Recommendations

They will be taught how to reflect in critically analysing their experiences after they have strengthened their Reflective thinking skills for student teachers in practice. In this regard, teachers may improve the ways they teach in their own classrooms (Hayden & Chiu, 2015; Yu & Chiu, 2019). By purposely observing, evaluating, and reflecting upon the process of problem solving, student teachers may strengthen their critical thinking ability (Rott & Leuders, 2017). It is recommended that the education faculties make both theoretical and practical undergraduate courses in CT and RT skills, models, and tactics for studies to create its rational growth. Education policies may should encourage lifelong learning by promoting reflective practices as a continuous professional development strategy. Policymakers can create opportunities for teachers to participate in reflective professional development courses throughout their careers ensuring that they remain involved in reflective learning.
To explore the association between critical thinking (CT) and reflective thinking (RT) skill researchers can concentrate these variables in future research in mathematical achievement, mathematics self-concept, metacognition and self-regulation. Also, correlating these with the same (or other) universes/samples. In analyzing that CT and RT skills occurrences of studies, it is seen that mixed research patterns which require a rigorous interpretation of quantitative data with qualitative data is insufficient. Future research should explore the ways in which these reflective practices can stimulate those sub-skills to be further developed. If the relationships between our observation, communication, decision making and judgement ability, teamwork and reflective practices are at least better understood, teacher training programs will be capable of offering more specific and hence, effective, interventions. This ensures that the reflective activities develop educators' most relevant skills as well as enhance their teaching and classroom management efficacy.
This study targeted prospective teachers solely, therefore; subsequent research should sample more diverse populations such as elementary school, middle school, high school students and teachers. That would help to increase their external validity and understanding of how these results might

generalize across various educational settings. CT and RT are also widely considered important in their own right (particularly in medical education, where they serve as domains of both teaching and clinical decision-making (Forrest, 2008). However, future research could investigate the context specificity versus generality of such skills by conducting similar studies in other disciplines and approaches to training (e.g. in medicine or engineering). A cross-field comparison of the results would further elucidate the process by which CT and RT competencies are learned as well as used, thereby increasing the transferability of the results to many educational and occupational arenas.

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