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Pedagogical Innovations for Teaching Critical Thinking in Elementary Schools: A Qualitative Case Study in Sialkot

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Abstract

This research is concerned with pedagogical innovations aimed at improving critical thinking skills in classroom practices in elementary schools in District Sialkot, Pakistan. Although international educational reforms emphasize higher-order thinking skills, teacher training programs in Pakistan are still dominated by lecture-based and traditional pedagogies, which limit students' analytical and reflective capacities. The study employs a qualitative case study research design to explore teachers' perceptions and use of pedagogical strategies, including inquiry-based learning, reflective teaching, collaborative learning, and the use of digital instructional tools. Data were collected through semi-structured interviews with eight teachers purposively selected from public elementary schools of Sialkot. The study explores the alignment between theoretical training frameworks and classroom practices and institutional, curricula, and resource-related constraints on pedagogical innovations. The findings suggested that pedagogical innovations help to develop critical thinking skills in elementary classrooms. It is suggested to provide better resources, professional development opportunities and supportive policies to enable teachers to practice these pedagogical innovative strategies more effectively in the classroom settings. The study proposes that teachers receive training to help them use inquiry-based learning, collaborative activities, and technology efficiently in the classroom settings. It also recommends making advancements in school infrastructure with the latest assessment design to develop critical thinking skills and problem-solving techniques instead of rote learning.

Keywords: Teacher Training, Critical Thinking, Pedagogical Innovation, Classroom Practices, Sialkot District.

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Introduction

Critical thinking is a disciplined and self-regulated process that involves logical reasoning, questioning assumptions, self-reflection, and introspection (Mozaffari et al., 2021). It is a significant competency of the 21st century education system that enables learners to analyze information critically and merge different concepts to enhance decision-making skills. Higher-order thinking skills are considered especially important in education; students' skills are better nurtured by teachers who think critically (Ennis, 2018). In Pakistan, education policy emphasizes the importance of critical thinking techniques in education, but its implementation is still a big challenge (Jamil et al., 2025b). Critical thinking skills play a great importance in teacher education programs (Bellaera et al., 2021). Teachers have dual responsibilities: they not only develop critical thinking in learners but also inculcate these skills in students, who are future educators. This role makes teachers a significant position in the education system, which transforms policy goals in the classroom settings. Their ability to demonstrate, teach and assess critical thinking skills directly affects the quality of future teacher preparation and consequently the intellectual standard of the overall education system.

Rote learning, memorization, teacher-centered instruction, and examination-oriented curricula are common classroom practices that ignore students' intellectual competencies. For example, a study in Pakistan with science teachers revealed that the use of inquiry-based approaches, which are crucial to develop critical thinking skills, was severely hampered by systemic pressures such as large class sizes, lack of resources, and the stereotypical examination system (Jamil et al., 2025b).

From a pedagogical innovation perspective, such as inquiry-based learning, reflective practice, problem-posing pedagogy, and collaborative learning, are effective alternatives. These learning practices belong to constructive theories. According to this theory, learners learn through active engagement, social interaction, and problem-solving techniques (Vygotsky et al., 1978). Research in higher education departments has shown that when the IBL and interactive, student-centered methods are applied with the support of inclusive leadership and institutional support, then the critical thinking in students will be increased (Abrami et al., 2015; Hattie, 2012; Jamil et al., 2024; Jamil et al., 2025a). The research needs to give importance to teacher educators in the development of future generations of educators who can produce critical thinking skills in classroom practices.

It is important to understand the gap between the aim outlined in policy and the practices of the teacher education programs. For this study, a qualitative case study design is used to explore the teachers' classroom strategies that foster critical thinking as a methodological innovation to adopt for the teaching-learning process and the strategies for its possible implementation. This study explores how teachers practice critical thinking as conceptualizing innovation, (b) which pedagogical strategies are part of teachers' training programs (c) how school teachers practice these strategies in the classrooms (d) which constitutional contextual constraints are the barriers to its effective implementation. In the cultural context, this study provides grounded evidence and aims to develop a culturally relevant framework that offers guidelines for implementing critical thinking pedagogy in teacher education institutions in Pakistan.

The study is to address policymakers, teachers, and school leadership about the “disparity gap” between the policy goals and classroom settings. Especially, the research aims to seek a groundbreaking shift in teaching practices, encouraging the use of a reflective, dialectic, and student-centered approach to inculcate critical thinking in learners for social, professional, and academic challenges (Freire, 2000).

Objectives of the Study

1. To explore elementary school teachers' perceptions of pedagogical innovations that can facilitate critical thinking in the classroom.
2. To investigate how elementary school teachers, perceive and apply pedagogical innovations to foster critical thinking skills in their classroom practices.
3. To identify institutional, curricular and resource related challenges that elementary school teachers consider as obstacles to the effective implementation of pedagogical innovations for the teaching of critical thinking.

Literature Review

Defining Critical Thinking in Education

Multi-dimensional thinking is supposed to be critical thinking. It includes for instance analysis, evaluation, inference and dispositions like curiosity, open-mindedness, and intellectual humility (Ennis, 2018; Facione, 1990; Paul & Elder, 2019). In addition to classroom instruction, students need to learn how to use the skill in a meaningful context of the real world (Yu & Zin, 2023). Critical thinking is one of the 21st century's skills, and the education community recognizes it.

Theoretical Foundations: Constructivism and Critical Pedagogy

Pedagogical innovation for critical thinking utilises Vygotsky's social constructivist theory, which holds that knowledge is based on social interaction, scaffolded dialogue, and authentic tasks. (Neutzling et al., 2019). According to this perspective, the teacher creates such a learning environment in which students are enabled to question, reason and reflect. Similarly, Critical pedagogy, in Freire's problem-posing education, challenges the traditional "banking model" and gives importance to dialogue and collective inquiry for raising critical consciousness (Brookfield, 2013; Freire, 2000).

Methodological Innovation in Teaching Critical Thinking

The problem-solving method helps the learners to solve the unclear and complicated challenges of the real world through collaborative approaches. PBL methods provide a systematic critical review of the solutions to the problem, and it put a positive impact on logical and analytical thinking (Abrami et al., 2015). Inquiry-Based Learning (IBL) is an inquiry-based learning it is expected from students to think logically and critically about any phenomenon which is similar to critical thinking skills (Hughes et al., 2014). A science project-based study conducted in Bangladesh proves that students enhance their abilities by using the IBL method and 21st-century skills.

Metacognitive activities reflect this factor that teachers and students analyze their thinking practices, identify the challenges, and learn to use their lived experiences, and the collaborative learning and Socratic dialogue method is a learning process that enhances the students' and teachers' logical and thinking skills and improves their collaborative learning skills. According to Socrates' argument, mapping and questioning are the best ways to develop critical thinking skills among students and teachers as well (Brookfield, 2013). Storytelling pedagogy is also the best technique to use when we face the challenges related to limited resources and lack of technology integration in classes; such activities bring revolutionary skills for critics. For example, in Pakistan, a framework was developed for the history class to facilitate students' analytical and logical reasoning (King, 1995).

Teacher Education and Critical Thinking Development

Teacher education develops the critical thinking skills of future teachers (Darling-Hammond et al., 2017). Reflective practices, field-based experiences, and dialogic pedagogy included in programmes can nurture critical thinking among educators (Shulman, 2005). The gap between theory and implementation is evident in Pakistani studies. Critical thinking practices are somewhat integrated in the classroom, but assessment and technology use are limited. In the Pakistani context, there is a lack in the examination system, large classes, and limited teachers' training, which prevent meaningful adoption of critical pedagogy in the education system, as reported by local studies. School exams promote rote learning, but national policy gives importance to critical thinking skills (Jamil et al., 2025b). Institutional and leadership factors: educational leadership connects teaching methods to how well students do. It involves things like Project-Based Learning (PBL). Flipped classrooms. Teachers use thinking as a new approach in leadership that includes everyone (Kemmis et al., 2014).

There is a lack of correlational research on methodological creation on critical thinking despite contextual research policy in Pakistan. The present educational system emphasizes higher education mainly or leaves the classroom practices set apart. There is very little research which shows the continuous process of implementation of critical thinking practices in the classroom. The gap identifies the in-depth study to explore the innovation conceived by the teachers, pre-service engagement and how they implement it in-service, and to check the control of institutions.

Research Methodology

Research Design

It was qualitative research (Creswell & Poth, 2016) with multiple case study research design to understand and explore the participants' experiences, perceptions, and classroom practices in detail. With the help of this approach, we can understand the complex educational process in a contextual manner, where teachers use their teaching strategies. Multiple case study research design informed by the phenomenological theoretical framework was used because it helped the researcher develop a complex understanding of the participants' perceptions and practices to the phenomenon being studied (Thomas, 2021; Yin, 2018).

Sampling

The purposive sample, using a criterion sampling technique (Patton, 2015), was used in this study. Criterion sampling involves selecting cases that meet some predetermined criterion of importance. It implies that sample selection has to be made in line with set criteria. 11 participants were taken from 8 public elementary schools of the District Sialkot. They were actively performing their duties and had more than ten years of experience in the teaching field.

Data Collection and Analysis

Data were collected through semi-structured interviews. The interview guide was designed based on research objectives and questions. Interviews were conducted in both English and Urdu languages for the convenience of the participants so that they could fully express their views and feelings. The duration of each interview was about 45-60 minutes. With the permission of the participants, the interview was transcribed. Data were analyzed based on the reflexive thematic analysis framework (Braun & Clarke, 2021) following six steps.

Ethical Considerations

To ensure ethical considerations, researchers obtained formal permission from the authorities. A consent form was taken from the participants who were involved in the study. To ensure confidentiality, participants' numbers were used. All the recordings and transcribed field notes were saved for further analysis. All the participants were informed about the right to withdraw at any time without any negative consequences, and their participation was voluntary.

Trustworthiness

Trustworthiness of the study was ensured through credibility, confirmability, dependability and transferability given by (Lincoln, 1980). To ensure credibility, the member checking technique was used in the study. The participants were given the chance to review and verify their responses and their response interpretation. To ensure dependability, the record of the research process was maintained properly, including the data collection procedures, coding decisions and theme development. For ensure confirmability, the documentation was maintained carefully to minimize researcher bias. The rich and detailed description of the participants, research context, findings and interpretation of Roman Urdu to define the understanding of the results in the same context ensures the transferability. These principles are used to support the rigour and trustworthiness of the study (Creswell & Poth, 2016).

Findings of the Study

The findings of the study is presented based on the following themes and subthemes keeping in view the research objectives.

Theme 1: Pedagogical Innovation as a Means of Fostering Critical Thinking

The first theme is the general perception of critical thinking in the classroom as a tool for students to go beyond rote learning and towards deeper understanding, questioning, analysis and application, by teachers. The participants saw teaching that helps students think for themselves, ask questions, relate ideas to life, and form their own opinions, not as an abstract theory but as any form of pedagogy.

Subtheme 1.1: Conceptualization of Critical Thinking

Participants always described critical thinking as deep thinking, not recall. For many, questioning, explanation, reflection and linking learning with everyday life were the strongest markers of it.

Participant 2 said that *“Critical thinking for me is to think, question and understand the ideas instead of memorizing them. It is about analyzing information, thinking about it and forming your own opinion instead of taking everything as it is given.”*

According to participant 1: *“Critical thinking is when we look at any issue, information or topic, we think about it and come to a conclusion, and then we assess it with reasoning and evidence.”*

Participant 4 said that *“For me, critical thinking is that students aren’t just memorizing lessons, but that they understand them, think about them, and come up with their own ideas.”*

Subtheme 1.2: Experiential Development of Innovative Pedagogical Competence

Teachers reported familiarity with inquiry-based learning, collaborative learning, reflective teaching and technology-supported instruction, often through B. Ed./M. Ed. workshops, CPD and departmental training. However, there was a regular emphasis from participants that real understanding was through trial, reflection and classroom experience and not theory alone.

Participant 5 reported that *“These are the methods I learnt in my professional degrees such as B. Ed & M Ed,”* said one participant. The programs provided theoretical knowledge and classroom management strategies for elementary teaching. *“But real learning comes through the experience in the classroom.”*

In the view of participant 7, *“I learned about these methods during my B.Ed and M.Ed studies, especially through presentations and group activities. But honestly, real learning comes from classroom experience.”*

Participant 8 also linked awareness with formal support when she said: *“Our department gives us a lot of training like CPD, HOTS, and LOTS which promotes my teaching skills and develop these skills in my personality.”*

Subtheme 1.3: Teacher Beliefs in Innovative Pedagogies for Critical Thinking Development

Most of the teachers agreed that innovative pedagogies develop critical thinking because they require students to analyze, discuss, explore, and problem solve rather than retell the textbook material. They based their belief on the outcomes of the classroom they observed, such as increased participation, increased clarity of concepts and diverse student responses.

Participant 5 explained, *“Yes, I strongly believe that innovative teaching strategies develop critical thinking. When teachers ask questions instead of directly giving answers, students are encouraged to think, explore, and analyze. This transforms learning from memorization to understanding.”*

Participant 4 explained,

When I teach a lesson and students solve exercises, my effort is that students solve them themselves. Every child’s answer is different from another child’s answer. Even if they make sentences, my effort is that if I have twenty students, then at least ten different sentence structures should be there.

Participant 6 further noted, *“Instead of only giving textbook exercises, we should design questions that make students think. Even in subjects like math, it’s important that students understand the concept instead of just memorizing steps.”*

Theme 2: Pedagogical Innovation Through Inquiry, Collaboration, Experiential Learning, and Digital Integration

The second theme indicates that teachers talked about implementation in practical, flexible and context-sensitive ways. Their examples suggest that pedagogical innovation in Sialkot elementary classrooms is enacted through local objects, group tasks, observation, storytelling, and discussion, model-making and sometimes digital media rather than highly formalized instructional models.

Subtheme 2.1: Inquiry-Oriented Learning Through Observation and Real-Life Connections

Most of the teachers said that they began the lesson by asking students to look around them, make sense of a story, make predictions or answer an open-ended question. This suggests that inquiry was used more as guided questioning and structured observation than as totally independent research.

Participant 1 remembered a geometry lesson: *“I start by having the students look around the room rather than starting with shapes.”* They find real stuff. Windows, doors, tables and tables. They describe and compare the forms they produce. Students learn about shapes naturally, by observing.

Participant 8 said: *“I told them to look around and see what blessings of Allah Almighty us are around and what nature has given to us.”* Another participant, 6, narrated, *“I asked the students what was important in the story, what was learned from the story and what was the moral lesson,”* said one literature teacher. Students discussed the story's morals.

Subtheme 2.2: Collaborative Learning for Multiple Perspectives and Critical Dialogue

Working in groups and peer discussions have driven the development of critical thinking. Teachers liked collaborative learning because it enabled students to exchange ideas, compare answers and be active, especially if the tasks were well defined.

According to Participant 2, *“I would group three or five students together,”* Participant 3 said. *“In that children do their parts very well, and there is a growing sense of competition between them.”*

Participant 3 said, *“Students work together in groups to find solutions to problems, which slowly teaches them to develop habits of inquiry and analytical thinking.”*

In the view of participant 4, *“it develops students’ ability to communicate ideas and points of view and to work in small groups to solve problems or accomplish tasks.”* As another participant 8 said, *“After the activity each group shares their ideas with the class and then there is discussion and reflection.”*

Subtheme 2.3: Experiential and Digital Pedagogies for Critical Thinking

Teachers also used materials, demonstrations, projects, videos, online resources, smart classrooms and classroom displays to facilitate conceptual understanding. These tools were appreciated not because they were new but because they enabled students to watch, talk and do ideas.

Participant 5 reported, *“The government has digitized elementary schools in District Sialkot and established at least one smart classroom/computer lab in schools equipped with modern computers.”*

Participant 6 explained,

I use educational videos, presentations, and online learning materials to introduce topics and encourage discussion. After watching a video or exploring a digital resource, I ask students questions that require them to analyze information, share their opinions, and explain their reasoning.

Participant 7 described an English activity, saying, *“I assigned them to make cards; I provided them with materials as well, and the students were very excited; they found the ideas with the help of internet digital media and made different cards.”*

Subtheme 2.4: Theory–Practice Gap in the Implementation of Innovative Pedagogies

Although teachers appreciated the modern pedagogy, they thought that classroom practice was only part of what they had been taught in training. The data suggest that innovation was frequently scaled down or combined with traditional teaching because of time, class size, behaviour problems and resource constraints. In the view of participant 7,

Teacher training is often very different to what happens in the classroom,” said one participant. The most effective methods are training programs, but teachers in real classrooms have to deal with large classes, administrative work, lack of resources and lack of time.

Participant 2 said, *“My training gave me a solid background in classroom management, lesson planning and basic teaching strategies. But it did not really prepare me for all these modern demands.”*

One participant (6) summarized this tension by saying, *“My training was valuable, but I think teacher education programs should place more emphasis on hands-on practice with innovative pedagogical approaches, educational technology, and strategies for developing students’ critical thinking and problem-solving skills.”*

Theme 3: Contextual Constraints and Adaptive Practices in Pedagogical Innovation

The third theme relates to structural barriers for full implementation of pedagogical innovation. The teachers say the key issues are heavy syllabus, lack of resources, poor infrastructure, uneven training and large classrooms. But they were also agents of change in their methods, using local materials and adapting innovations to what was possible in their situation.

Subtheme 3.1: Classroom Constraints on Innovative Pedagogical Practice

The most common constraints to ideal use of inquiry-based or collaborative approaches were identified by teachers as large class sizes, lack of materials, lack of time and diverse learner needs. These realities made individual facilitation and sustained inquiry challenging.

One teacher (5) noted, *“When managing two classes or multi-grade teaching situations, we often face limitations such as large class size and insufficient teaching materials. In such conditions, it becomes difficult to focus on all students equally.”*

Another participant (4) narrated, *“Implementation is not always fully successful due to inadequate infrastructure, limited resources and disruptive student behaviours”*

Subtheme 3.2: Curriculum and Assessment Pressures Limiting Critical Thinking Pedagogy

According to this subtheme, teachers are driven towards coverage and memorization due to the curriculum load and exam expectations. This creates tension between the rhetoric of policy and the priorities of the classroom. It is highlighted that Pakistani classrooms are still mired in *“rote learning, memorization, teacher-centred instruction and examination-oriented curricula”*, which is a disservice to the intellectual growth of students.

One participant (6) captured this tension indirectly by explaining that early teaching was more about *“completing the syllabus,”* whereas later experience shifted the focus to meaningful understanding.

In the view of participant (7), *“Assessment systems need to be revised” so that examinations measure “understanding, reasoning, and application of knowledge rather than rote learning.”*

Subtheme 3.3: Adaptive Pedagogical Practices Under Resource Constraints

Teachers work with limitations, according to some practical examples, cheap materials, the school context, selective integration of technology, and not abandoning the pedagogy of critical thinking. The answers they provide suggest that the innovation happening in these environments will likely be incremental.

One of the participants (5) explained, *“I used mostly things like leaves, flowers, wood, which are easily available in the school premises, to promote the motor skills development in the students.”*

Participant 3 said, *“I did not use any fixed approach in the classroom. I used activity-based learning techniques, which promote critical thinking skills in the learner; some I used the discussion method and the practical method.”*

A teacher (7) also described combining available tools with discussion: *“Access to technology is sometimes limited, so I often combine digital resources with classroom discussions and group activities.”*

Discussion

The findings show that the elementary school teachers of Sialkot are generally in favour of a constructivist interpretation of critical thinking based on questioning, reflection, concept clarity and application rather than rote memorization, which is in direct alignment with the theoretical and conceptual framework of the article. The teacher used pedagogical innovation to inculcate critical thinking skills in the students. The data also suggest that teachers are not resistant to pedagogical innovation, but are open to inquiry-based learning, collaborative activities, reflective teaching and the selective use of technology, and that the implementation of such approaches is constrained by the practicalities of the classroom. This supports the article’s arguments that the heart of the problem is not only a deficit of awareness but the persistent gap between the ideals of training, policy discourse and conditions of implementation in schools.

The transcripts provide important local evidence that teachers often innovate with small but significant practices such as guided questioning, storytelling, group discussion, observation tasks, model-making and local-material activities. The findings also support that student centered pedagogical innovations also gives students the opportunity for active learning and construct their knowledge instead of rote learning this finding is also supported by Darling-Hammond et al. (2017), where they laid the importance of innovative pedagogical and interactive teaching practices develops high-order thinking skills and meaningful learning capabilities. The finding also revealed that collaborative learning helps to develop critical thinking skills in the students; the teachers divided the students in mixed ability groups where they learn from each other. The findings align with the work of Vygotsky (1978); he suggested that learning occurs through social interaction and collaboration. Collaborative learning is effective and inculcates reasoning, communication and problem-solving skills in the learner. The teachers also show the challenges they faced, like limited resources, inadequate infrastructure, classroom management issues and the pressure of syllabus completion. The study suggested that pedagogical innovations have the ability to develop critical thinking skills, but for successful implementation there should be continuous professional development, institutional support and proper allocation of resources are needed.

Conclusion

The study revealed that the elementary school teachers of Sialkot perceived that pedagogical innovation is a practical way to motivate students from memorization to understanding, questioning and analytical engagement. The findings suggest that teachers like inquiry, collaboration, reflective teaching and digital tools, and many are already using simplified versions of these strategies in their classrooms to promote critical thinking. But research shows that innovation does not happen evenly across the classroom, due to large class sizes, pressures of the curriculum, lack of time, lack of resources, and disconnect between teacher prep and what is really happening in the classroom. In sum, the evidence suggests that critical-thinking pedagogy is still in its beginning, but it requires further institutional, curricular and professional support to move from sporadic teacher effort to more sustained classroom practice.

Recommendations

The following are some recommendations based on the study findings.

- Increase the amount of practical work in inquiry-based learning, collaborative pedagogy, reflective teaching, and classroom technology in teacher education and in-service training.
- Reduce dominance of rote curriculum coverage. Align assessment systems to reasoning, application and open-ended thinking. Enhance school infrastructure and classroom resources, in terms of access to smart classrooms, digital tools, activity materials and reasonable class sizes.
- Encourage low-cost, context-sensitive innovation: encourage the use of local materials, storytelling, observation tasks and practical examples in elementary teaching.
- Enhance ongoing professional development, mentoring and school leadership support to help teachers more effectively translate training knowledge into everyday classroom practice.

Conflict of Interest

The authors showed no conflict of interest.

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References

- Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, C. A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta-analysis. *Review of Educational Research*, 85(2), 275-314.
- Bellaera, L., Weinstein-Jones, Y., Ilie, S., & Baker, S. T. (2021). Critical thinking in practice: The priorities and practices of instructors teaching in higher education. *Thinking Skills and Creativity*, 41, 100856.
- Braun, V., & Clarke, V. (2021). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, 18(3), 328-352.
- Brookfield, S. (2013). Teaching for critical thinking. *Handbook of Research on Teaching and Learning in K-20 Education*, 1-16.
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.
- Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. *Learning Policy Institute*.
- Ennis, R. H. (2018). Critical thinking across the curriculum: A vision. *Topoi*, 37(1), 165-184.
- Facione, P. A. (1990). The California Critical Thinking Skills Test- College Level. Technical report #1. Experimental validation and content validity.
- Freire, P. (2000). *Pedagogy of the oppressed* (30th anniv. ed.). New York: Continuum, 35.
- Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. Routledge.
- Hughes, W., Lavery, J., & Doran, K. (2014). *Critical thinking: An introduction to the basic skills*, American seventh edition.
- Jamil, M., Mehmood, W., & Noorani, Z. (2024). An analysis of Physics textbook grade X for critical thinking skills. *Pakistan Journal of Law, Analysis and Wisdom*, 3(4), 39-47. <https://pjlaw.com.pk/index.php/Journal/article/view/v3i4-39-47>
- Jamil, M., & Rizvi, S. A. A. (2025a). Critical thinking pedagogy in teacher education: An analysis of instructional practices in Pakistani higher education. *Journal of Development and Social Sciences*, 6(2), 107–119. [https://doi.org/10.47205/jdss.2025\(6-II\)10](https://doi.org/10.47205/jdss.2025(6-II)10)
- Jamil, M., Urooj, T., & Muhammad, N. (2025b). Fostering critical thinking in teacher education programs: Perceptions, practices, and challenges of teacher educators. *ProScholar Insights*, 4(3), 13-22.
- Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The action research planner: Doing critical participatory action research*. Springer. <http://dx.doi.org/10.1007/978-981-4560-67-2>
- King, A. (1995). Inquiring minds really do want to know: Using questioning to teach critical thinking. *Teaching of Psychology*, 22, 13-17. doi:10.1207/s15328023top2201_5
- Lincoln, Y. (1980). Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills: Sage. *Lincoln Naturalistic Inquiry* 1985.

- Mozaffari, Z., Abdollahi, M. H., Farzad, V., & Ghayedi, Y. (2021). The effectiveness of Paul-Elder model critical thinking training on students' critical thinking skill. *Journal of Educational Psychology Studies*, 18(44), 20-29. <https://doi.org/10.22111/jeps.2021.6536>
- Neutzling, M., Pratt, E., & Parker, M. (2019). Perceptions of learning to teach in a constructivist environment. *Physical Educator*, 76(3), 756-776.
- Patton, M. Q. (2015). *Qualitative research & evaluation methods*. Sage Publications.
- Paul, R., & Elder, L. (2019). *The miniature guide to critical thinking concepts and tools*. Bloomsbury Publishing USA.
- Thomas, G. (2021). How to do your case study. London: Sage Publications Limited.
- Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus*, 134(3), 52-59.
- Vygotsky, L. S., Cole, M., John-Steiner, V., Scribner, S., & Souberman, E. (1978). *The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Yazan, B. (2015). Three approaches to case study methods in education: Yin, Merriam, and Stake. *The Qualitative Report*, 20(2), 134-152.
- Yin, R. K. (2018). Case study research and applications: Design and methods (6th ed.). Sage publications.
- Yu, L., & Zin, Z. M. (2023). The critical thinking-oriented adaptations of problem-based learning models: a systematic review. *Frontiers in Education*. <https://doi.org/10.3389/educ.2023.1139987>.