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THE IMPACT OF PEDAGOGICAL PRACTICES ON THE DEVELOPMENT OF CRITICAL THINKING SKILLS AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

The development of critical thinking abilities has become a major aim in secondary education, so teachers need to use smart teaching approaches that actually involve learners in the process of learning. The current study aimed to (1) To explore the pedagogical practices being practiced by teachers at secondary school level, (2) Assess the role of these pedagogical practices in developing students' critical thinking skills, and (3) to rank the most effective pedagogical practices for fostering critical thinking among secondary school students. Descriptive Quantitative Research Design was adopted. The total number of Secondary School Teachers (SSTs), High School Teachers (HSTs), Junior Elementary School Teachers (JESTs), and Elementary School Teachers (ESTs) who form the target population is about 4,000 in 140 secondary schools of district Khairpur. The research involved collection of data from 230 respondents using simple random sampling method, where the questionnaire was used. The result showed high reliability with Cronbach's alpha being 0.868. Descriptive statistical tools such as frequency, percentage, means and standard deviation were applied in analyzing the data. The findings revealed that the teachers used learner-centered pedagogies quite often, where the most common pedagogies used were those involving teamwork and cooperation (92.2%). In addition, there was consensus among the participants that pedagogical practices were an important factor and play a vital role in the development of critical thinking skills among learners, especially reasoning exercises and inquiry-based tasks, which scored the highest frequency 194(84.4%) . Moreover, collaborative learning was found to be the most effective teaching method in terms of developing critical thinking skills. The study therefore found out that learner-centered pedagogical strategies have a great impact on development of critical thinking among secondary school learners. It is recommended that teachers be provided with continual professional development to reinforce the incorporation of these approaches into classroom teaching.



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Introduction

In the twenty-first century, education expectations have sort of been flipped, by focusing more on building higher-order thinking skills alongside academic knowledge, not only memorizing stuff. And in that mix, critical thinking has also gotten a lot of focus, like, considerable attention because it support learners to think independently, to analyze information, to solve problems, and form sound conclusions (Raj, Chauhan, Mehrotra, & Sharma, 2022). With rapid advances in technology and the flow of information, education has to be ready to equip learners with higher- order thinking abilities, so they can navigate really complex global challenges (Khotimah & Fauzi, 2026).

Pedagogical practices really matter a lot in shaping, students learning experiences and how their minds develop. These practices include classroom interaction, teaching methods, instructional methods, assessment techniques, and learning activities employed by teachers to facilitate student learning (Zamir, et al., 2021). It is explained by one of the research that learner-centered instructional approaches promote inquiry, reflection, teamwork, and active participation, all of which support the growth of critical thinking abilities (Xhomara, 2022). In the present era of AI, personal competencies like teamwork, emotional intelligence, and intrapersonal skills have become more and more important. Competency is basically the capability to use knowledge, practical know how, attitudes and values in a proper way, so they can be applied to settle problems, and it is frequently described as a skill, or even transversal skill in Anglo-Saxon contexts (Bezanilla et al.,2019).

Critical thinking is a key skill in contemporary education that allows students to analyze data, solve problems and reach sound decisions (Mehta, 2025). Critical thinking is important in the educational setting, to achieve success, but in real life, in dialogical communication and making decisions (Belhad, 2024). Critical thinking and problem-solving skills have become important qualities necessary to succeed in the personal and professional worlds as we progress into the fast- changing world of the 21st century (Rusmin, Misrahayu, Pongpalilu, & Radiansyah, 2024). Learners who exercise critical thinking and problem-solving are better prepared to face obstacles in the real world, flexibility, exhibiting increased creativity, and decision-making skills (Rusmin, Misrahayu, Pongpalilu, & Radiansyah, Critical Thinking and Problem-Solving Skills in the 21st Century, 2024). Consequently, teaching styles that are supportive of analytic thinking and critical examination are receiving more of attention by the Facilitators.

It is highlighted by the recent studies that there's a positive relationship between pedagogical practices and critical thinking development. For instance Bhuttah et al.,(2024) discovered that creative teaching strategies greatly improved students' academic achievement and critical thinking. Similarly one of the research have explained that interactive learning environments help students develop their critical thinking skills by giving them the chance to analyze, reflect, and solve problems (Blyznyuk & Kachak, 2024). Additionally one of the previous researches has revealed that different pedagogical practices like storytelling, discussion, questioning, project-based learning, inquiry-based activities and collaborative work can boost critical thinking of learners (Zamir, et al., 2021). Furthermore recent study defined that reflective learning strategies enhance

students' critical analytical skills and foster a deeper knowledge (Tlale & Liebenberg, Reflective Practice to Foster Critical Thinking among Students, 2024).

The critical thinking skills development is especially crucial in the secondary school level as students move toward greater academic independence and get ready for higher education and future careers. Unfortunately, many secondary classroom environments still depend on the conventional approaches of learning where memorization skills are valued over analysis (Amirova, 2025). Such strategies may hinder learners' opportunities to develop the cognitive skills required for effective problem solving and decision making.

In Pakistan especially in rural areas like district Khairpur, to enhance the quality of education is still a top priority, and encouraging critical thinking is becoming more and more important in educational changes. Even though the significance of critical thinking has been acknowledged by many, there is very little literature available on how the pedagogy affects the development of critical thinking skills in secondary school students in district Khairpur. This research will investigate the impact of pedagogical practices on the development of critical thinking abilities among secondary school students.

Research Objectives

1. To explore the pedagogical practices being practiced by teachers at secondary school level.

2. To assess the role of pedagogical practices in developing critical thinking among secondary school students.

3. To rank most effective pedagogical practices for developing critical thinking among secondary school students based on the study results.

Research Questions

1. What pedagogical practices being practiced by teachers at secondary school level?

2. What is the role of pedagogical practices in developing critical thinking among secondary school students?

3. Which pedagogical practices are most effective in enhancing critical thinking skills among secondary school students, according to the study findings?

Theoretical Framework

The research is based on Jean Piaget's Cognitive Development Theory and Lev Vygotsky's Social Constructivist Theory. These theories form a solid base for understanding the impact of pedagogical practices on the development of critical thinking skills in secondary school students.

The theory of cognitive development by Jean Piaget postulates that the construction of knowledge by individuals takes place via interaction with their environment rather than passive receipt of information (Chang, Bugti, & Rifat, 2025). Piaget held that individuals advance through different stages of cognitive development; adolescents fall within the formal operational stage where they gain the ability to reason abstractly, hypothesize, and solve problems (Ajayi, 2024).The Cognitive Development Theory of Jean Piaget (1952) stresses the fact that the learning capacities of children depend on the stage of their development and the environment they are in (Chang, Bugti, & Rifat, 2025). According to this theory, cognitive development takes place in an encouraging and safe learning environment. These cognitive skills are basic components of critical thinking. The pedagogical practices which enhance inquiry, problem solving, reflection, and participation support in developing cognitive skills and critical thinking among students (Sharma, Doshi, Verma, & Verma, 2022). So it is cleared from this theory that critical thinking is not something that one possesses; rather, it develops with time, practices and experience.

However, the theory by Lev Vygotsky on Social Constructivism is concerned with how learning takes place within a social context, and it requires interactions between the learner and teachers, other learners, and the surrounding culture (Wibowo, Wangid, & Firdaus, 2025). Vygotsky introduced this idea of the Zone of Proximal Development (ZPD), kind of like the gap between what learners can manage on their own , and what they can manage with the help, support, and guidance from a more knowledgeable person (Yusof, 2021). Vygotsky also explained the significance of scaffolding, whereby teachers give structured assistance that makes students capable of handling more difficult tasks (Azzaroiha, Redhana, & Suma, 2025). So the difference pedagogical practices like classroom discussion, collaborative learning, questioning techniques, and guided inquiry are aligned closely with Vygotsky's theory and promote higher-order thinking and critical reasoning.

Combining theories of Piaget and Vygotsky gives an overall view of how this research would be conducted. While Piaget illustrates how pupils learn it through individual cognitive maturation, whereas Vygotsky stresses the need of social contact and teacher support in fostering critical thinking development (Huang, 2021). The present study further supported by Constructivist theory, recent evidence Samuels (2024) developed and statistically validated the Classroom Constructivism Inventory (CCI) based on constructivist theories of Jean Piaget and Lev Vygotsky. When taken as a whole, these ideas imply that good teaching methods not only enhance the cognitive capacities of students but also establish cooperative learning settings that promote analysis, reasoning, assessment, and problem-solving. So, this study uses these theoretical lenses to see how teaching practices actually contribute in the making of critical thinking abilities among secondary school students, in particular.

Literature Review

Concept of Pedagogical Practices

The ways and approaches teachers use in their instructional process to ensure that learning is effectively achieved is known as pedagogical practices. Good pedagogical practices go beyond

mere transfer of knowledge and concentrate on the engagement of learners (Kapur, 2018). Modern ideas in education keep pointing at learner-centered approaches that push real involvement, together working, self reflection and inquiry (Shi & Blau, 2020). There are few ways of teaching, like problem based learning, project based learning and interactive instruction, which help to improve critical thinking abilities, enhance academic performance of the learners and also create friendly learning environment (Bhuttah, Xusheng, Abid, & Sharma, 2024).

Critical Thinking Skills

The art of critical thinking is an art of analysis and evaluation of information, reasoning and situation through the application of certain criteria in order to come up with insightful new knowledge, understanding, theories and belief (Heard, Scoular, Duckworth, & Ramalingam, 2020). It consists cognitive skills such as interpreting, analyzing, inferring, evaluating, explaining, and regulating oneself (Facione, 2015). Critical thinking is skill of someone's performance, attitude, and knowledge all contribute to critical thinking. It is thought that using inductive and deductive reasoning to solve problems leads to critical thinking, processing, and assessment of prior information with new information (Belhad, 2024). By these abilities, learners can analyze problems in different methods and make sound decisions based on facts rather than assumptions.

Pedagogical Practices and Critical Thinking Development

There are many researches which explored the relationship between pedagogical practices and critical thinking. One of the study explained that innovative teaching methods actually improved students' critical thinking and learning outcomes, because they pushed more active involvement and participation in the learning journey, which is not just passive listening or memorization (Okolie, Igwe, Mong, Nwosu, & Kanu, 2022). So their findings say that teaching methods focused on interaction, collaboration and problem-solving go along with better cognitive development, like it helps the mind grow in a steady way. Likewise another research also explained that those interactive learning environments foster critical thinking by giving students the chance to solve issues, analyze data, and think critically (Zamir, et al., 2021). However the research stressed the superiority of active learning over standard lecture-based training in developing higher-order cognitive skills. Critical thinking growth has also been found to be significantly aided by reflective learning strategies. According to Tlale & Liebenberg (2024), reflective exercises help students assess their education, pinpoint their advantages and disadvantages, and get a deeper comprehension. So these practices enhance critical thinking abilities as well as motivation. Questioning techniques have proven useful pedagogic approaches in secondary level education when it comes to fostering critical thinking among students. One of the research have explained that high-level questioning techniques aid in the evaluation and synthesis of information, making learning more engaging for students (Irfan, 2025). This is because such techniques promote classroom discussions that enhance the reasoning skills of students. More over research carried out in secondary schools in Pakistan confirms the link between involvement and critical thinking. Siddique, Jabeen, & Bhutto, (2024) have found out that the constructivist approach to teaching, which involves the process of students' involvement, is a key factor for the development of critical thinking skills.

Research Gap

Previous studies have established a positive relationship between teaching practices and the development of critical thinking skills but in existing literature several gaps remain. Much of the research has been carried out in higher education contexts with university students being the main participants (Zamir, et al., 2021; (Bezanilla, et al., 2019) .However, secondary school students have received relatively little attention, despite the importance of this stage in developing higher order thinking skills.

Secondly, most of the available studies have been dedicated to the analysis of the issue under consideration in the context of particular disciplines such as sciences, mathematics, and others (Ariza, Armenteros, & Castro, 2024; Irfan, 2025). Thus, there is not enough information concerning the role of pedagogical practices in developing critical thinking within general school subjects.

Finally, recent research has become increasingly focused on the use of artificial intelligence (AI), digital technologies, and technology-enhanced instruction as tools for supporting the process of critical thinking (Sitepu, et al., 2026). However, few researchers have considered the influence of pedagogical practices of the teacher including questions, collaboration, discussion, reflection, and active learning on students' critical thinking skills. Moreover, there has been limited empirical research looking at this relationship, specifically within District Khairpur, Sindh, Pakistan. Primarily most of these studies have been conducted in other nations or regions, making it somewhat difficult to state that their findings will necessarily apply to local secondary institutions. In this way, the present study tries to fill those gaps by looking into how pedagogical practices influence the growth of critical thinking skills in secondary school students, across general subjects, in District Khairpur, Sindh. The results are meant to provide evidence that is grounded in this particular context, and that can help teachers , school administrators , as well as policymakers in improving classroom practices that sharpen students' critical thinking skills.

Methodology

Research methodology can be seen as a systematic way of addressing a research problem. Research methodology includes data collection using various ways, data analysis, and data interpretation and finally making conclusions about the data of research. So it is a kind of a plan that is used to perform a research study (Purwanto, 2023).

Research Paradigm

A Research paradigm is shared perception and belief held by experts within an academic field concerning the manner in which issues should be defined and handled (Ebohon, Ajayi, & Ganiyu, 2021). This study uses the positivist research paradigm which posits that knowledge is created through objective observation, empirical evidence and the measurement of observable phenomenon. The research paradigm is used to provide the philosophy underlying research design, methods, and interpretation by making assumptions on issues such as reality, epistemology, and methodology

(Park, Konge, & Artino, The Positivism Paradigm of Research, 2019). Additionally, positivism is concerned with using quantitative methods, measured variables, structured data gathering tools, and statistics in the generation of objective and reliable findings from a large sample size (Park, Konge, & Artino, 2019; Park, Konge, & Artino , 2020; Phoenix, et al., 2013) Since the research was conducted to give objective explanations about teachers' perception on teaching methods associated with critical thinking among secondary school students, the positivist paradigm would serve well to support the aims of the study (Park, Konge, & Artino, 2019; Phoenix, et al., 2013) . Present study is align with positivist paradigm as it used quantitative descriptive research design, collected numerical data from 230 secondary school teachers of District Khairpur through structured questionnaire and analyzed data through SPSS Version 27.

Research Design

A description of the framework of methods and techniques which the researcher will use for conducting research is called research design (Wisenthige, 2023). Research design is the blueprint used for the planning, conduct and analysis of the research; the quantitative research design is based on the collection and analysis of numeric information (Slater & Hasson, 20225). Quantitative descriptive research design was used in this study. This kind of design was chosen for the reason that it enables the researchers to describe what is already there and to analyze the perceptions of the respondents without manipulating any variable. This also includes collecting of numerical data.

Population

A group of all units that have a variable characteristic under investigation for which research findings can be generalized known as population (Shukla, 2020).The target population was about 4000 government secondary school teachers in the district of Khairpur Sind. As per the records available from the District Education Officer (DEO), Khairpur, there are 140 government secondary schools in the district. The population involved was those teachers working in various teaching cadres, which include HSTs (High School Teachers), JESTs (Junior Elementary School Teachers), ESTs (Elementary School Teachers), and SSTs (Secondary School Teachers)

Sampling Technique

Sampling is like selecting a representative subset from a larger population or dataset to analyze, or even test, and to make sense of it (Makwana, Engineer, Dabhi, & Chudasama, 2023). One of the methods commonly employed in survey research within quantitative studies is simple random sampling (Noor, Tajik, & Golzar, 2022). Simple Random sampling is used in the sampling process. The simple random sampling technique made sure that all the teachers had an equal opportunity of being sampled, hence minimizing sampling bias.

Sample Size

Sample size referred as the number inside each group, and it is often what we wish to estimate (Fink, 2009). A total of 230 secondary school teachers were finally selected as a sample, who was teaching in the Government Secondary Schools of District Khairpur. The sample comprised HSTs, JESTs, ESTs, and SSTs

Data Collection Instrument

Collection of data is among the significant stages of any research study that allows the researcher to obtain answers to research questions (Taherdoost, 2021). The data were collected using a structured questionnaire adapted from an earlier instrument used in (Zamir, et al., 2021; Bezanilla et al., 2019) that was linked to pedagogical practices. There were 30 items in the questionnaire, out of which ten items each measured the three objectives of the study. Questionnaire was used to gauge the views of teachers about the pedagogical practices that promote critical thinking skills of students in secondary schools. The ability for a measure to produce consistent results across time known as reliability (Segal & Coolidge, 2018). A reliable test or tool is one that gives the same result if the respondent takes the test under similar conditions without any other interfering factors. Reliability of the tool was tested using Cronbach's Alpha in SPSS Version 27 and its value was 0.868.

Data Collection procedure

A data collection process refers to a systematic way of collecting data systematically, making sure that it is complete and consistent so as to estimate reliably reliability (Wohlin, Höst, Runeson, & Wesslén, 2003). The data about government secondary schools of district Khairpur obtained from The District Education Officer (DEO), Khairpur, and who also supported with data collection. In order to gather responses, the researcher sent the questionnaire through WhatsApp and also visited some secondary schools to collect data from teachers. Once the data was completed, the answers were coded, and ready for data analysis.

Dana Analysis

Data Analysis is that vital component of the research process which ensures that the findings obtained from it have an impact. Which includes the collection, transformation, cleaning, and modeling of data in order to discover the desired information It helps the researcher draw conclusions in a research (Dibekulu, 2020). Analysis was done using Statistical Package for the Social Sciences (SPSS) Version 27 through coding, entry, and analysis of the data collected. Descriptive statistics that involved frequency, percentage, mean, and standard deviation were employed to describe the demographics of the respondents and their response concerning pedagogical methods and development of critical thinking skills among the secondary school learners. Then obtained results were interpreted based on the research objectives.

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
.868	30

In table 1 the reliability analysis of the research instrument is shown. The instrument contained 30 items and had a Cronbach's alpha value of 0.868. The result obtained above is an indication of good internal consistency reliability of the items in the scale. The instrument can therefore be said to be reliable since the Cronbach's alpha value is above the required level of 0.70 (Taber, 2018).

Demographic Statistics

Table 2: Gender of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	123	53.5	53.5	53.5
	Female	107	46.5	46.5	100.0
	Total	230	100.0	100.0	

In Table 2 the gender distribution of the respondents is presented.107 (46.5%) were female and 123 (53.5%) were male from the total 230 participants. According to the results, there were somewhat more male respondents than female respondents. So, the distribution indicates that both genders were well represented in the research providing a balanced sample for data analysis.

Table3: Teaching Experience of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	61	26.5	26.5	26.5
	6-10 years	92	40.0	40.0	66.5
	11-15 years	44	19.1	19.1	85.7
	more than 15 years	33	14.3	14.3	100.0
	Total	230	100.0	100.0	

Table 3 presents the experience of the respondents in teaching. Total 230 respondents participated from which, 92 (40.0%) had a teaching experience ranging from 6 to 10 years, which is the highest number. The next highest number of respondents were 61 (26.5%), who had 1-5 years of teaching experience; 44 (19.1%) had a teaching experience of 11-15 years and finally 33 (14.3%) respondents had more than 15 years of teaching experience. It is evident from the above figures that the majority of the respondents had considerable experience in teaching (6-10 years).

Table 4: Educational Qualification of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor`s degree	28	12.2	12.2	12.2
	Master`s degree	124	53.9	53.9	66.1
	M.Phil or Higher	78	33.9	33.9	100.0
	Total	230	100.0	100.0	

In table 4 the educational qualifications of the participants are shown. Of the total 230 participants in the study, 124 (53.9%) were having Master's Degree, and this is the maximum number in the sample population. The next highest category of qualifications was the one with 78 (33.9%) respondents having M.Phil Degree or higher qualifications. In addition, 28 (12.2%) respondents had Bachelor's degree. So the results show that a majority of the participants had high qualifications, as almost half of them had Master's Degree and one-third of them had qualifications above Master's level. Hence, the study was done on qualified teachers.

Table 5: Designation of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	EST	68	29.6	29.6	29.6
	JEST	89	38.7	38.7	68.3
	HST	37	16.1	16.1	84.3
	SST	36	15.7	15.7	100.0
	Total	230	100.0	100.0	

The above table highlights the designation of the respondents. From the aggregate participants 230, 89 (38.7%) were designated as Junior Elementary School Teachers (JESTs), which is the biggest category in the respondents' participation. And Elementary school teachers who participated in the study were 68 (29.6%), 37 (16.1%) High School Teachers (HSTs), and 36 (15.7%) Secondary School Teachers (SSTs). Hence the results show that JESTs formed the largest portion of the respondents, followed by ESTs, HSTs, and SSTs. This shows the involvement of teachers from various designations in the teaching profession.

Table 6: Pedagogical Practices being practiced by teachers at secondary school level

S.NO	pedagogical practices being practiced	Frequency S.A+A	%	Mean Value	Std.D
01	storytelling and discussions	169	73.5%	3.8739	1.29720
02	verbal presentations	172	74.7%	4.0957	1.12124
03	continuous feedback	180	87.3%	4.3000	.92585
04	Thought provoking questions	194	84.3 %	4.2957	.85114
05	contextual examples to connect theory with practice.	196	85.2%	4.2696	1.05169

06	project-based and problem-solving activities	194	84.3 %	4.2957	.90098
07	generalizing and specifying reasoning activities	194	84.3 %	4.2348	.86998
08	Writing reflective essays	209	90.9 %	4.4261	0.79365
09	Small scale classroom inquiry based activities.	208	90.8%	4.4304	0.76033
10	teamwork and cooperative learning	212	92.2 %	4.5522	.75018

Table 6 represents Items 1-10 about Pedagogical Practices being practiced by teachers at secondary school level

Item: 1 Storytelling and Discussions

The findings show that 169 (73.5%) respondents agreed that they use storytelling and discussions as a pedagogical practice. 3.8738 which is the mean score and (SD = 1.29720) indicates that this strategy is practiced by most teachers, although it is the least frequently used among the ten pedagogical practices.

Item: 2 which is about verbal presentations, of the 230 participants, 172 (74.7%) used verbal presentation techniques in the classroom. An average score of 4.0957 (SD = 1.12124), it is clear that there is a common practice among teachers to encourage oral presentation of ideas.

Item: 3 is about continuous feedback The findings show that 180 people (87.3%) confirmed that they give feedback continuously to their students. The average rating of 4.3000 (SD = 0.92585) clearly shows that giving continuous feedback is a commonly used technique for supporting the development of students ` critical thinking.

Item: 4 explain Thought-Provoking Questions are explained. From the results, 194 (84.3%) people respond to using thought-provoking questions in their teaching. And the mean score is 4.2957 (SD = 0.85114) suggests that the teachers often ask their students to think critically and engage in class discussions.

Item: 5 is about the Contextual Examples to Connect Theory with Practice. A total of 196 (85.2%) participants admitted to the use of contextual examples as a method of making theory applicable to practice. And the average of 4.2696 (SD = 1.05169) implies that teachers make frequent use of practical examples.

Item: 6 is about Project-Based and Problem-Solving Activities. The analysis reveals that 194 (84.3%) respondents have adopted problem solving and project based activities. And the mean

value of 4.2957 (SD = 0.90098) proves that teachers usually involve their students in activities that foster the development of problem solving skills.

Item: 7 is about Generalizing and Specifying Reasoning Activities. It was discovered that 194 (84.3%) of respondents utilize reasoning activities during teaching process. And the mean score of 4.2348 (SD = 0.86998) shows that teachers often motivate their students to develop reasoning and analytical abilities.

Item: 8 is about Reflective Essay Writing. It was found out that 209 (90.9%) respondents assign their students reflective essays. And the mean score of 4.4261 (SD = 0.79365) shows that reflective writing is one of the most popular teaching practices in secondary schools.

Item: 9 which is about Small-Scale Classroom Inquiry-Based Activities From the obtained data the findings showed that 208 (90.8%) respondents use small-scale classroom inquiry-based activities. The mean score of 4.4304 (SD = 0.76033) shows that this practice is popular enough among teachers to promote student involvement in the learning process.

Item: 10 is about Teamwork and Cooperative Learning So form the responses it's observed that 212 (92.2%) respondents engage in teamwork and cooperative learning activities. Hence it becomes the most popular teaching practice among respondents. And the mean score of 4.5522 (SD = 0.75018) indicates the high level of agreement.

Table 7: The role of pedagogical practices in developing critical thinking among secondary school students

S.N0	the role of pedagogical practices in developing C.T	Frequency S.A+A	%	Mean	Std. D
11	Storytelling ,interactive lectures and discussions	184	80%	4.3522	1.14166
12	Classroom debates and presentations	185	80.4 %	4.2739	1.10525
13	Timely feedback	187	81.3%	4.2957	1.05296
14	Questions-answer	191	83 %	4.2391	.99309
15	contextual examples	192	83.5%	4.3478	.95801
16	Project-based, problem-solving	192	83.5%	4.4565	.92766
17	Reasoning exercises	194	84.4%	4.3478	.88701
18	Writing assignment and essays	191	83%	4.2391	1.02341
19	inquiry-based tasks	194	84.4%	4.2739	.96611
20	Collaborative work	192	83.5%	4.4217	1.00673

Table 7 consists on 10 items aligned with the second objective of the research.

Item 11: Storytelling, Interactive Lectures, and Discussions

From the results above, it can clearly observed that 184 participants (80.0%) were in agreement that storytelling, interactive lecture, and discussion methods have an important part to play in cultivating critical thinking among students. And the average score of 4.3522 (SD = 1.14166) shows that teachers strongly feel that these types of teaching methods foster critical thinking among students.

Item 12: Classroom Debates and Presentations

From the obtained data overall, 185 (80.4%) participants affirmed the role of class discussions and presentations in the development of critical thinking skills. The average score of 4.2739 (SD = 1.10525) means that the teachers believe the activities to be helpful in developing the skills in expression and evaluation of ideas.

Item 13: Timely Feedback

It is clear from the results obtained that 187 respondents (81.3%) felt that feedback is very important for developing the critical thinking ability. This is evident from the mean score of 4.2957 (SD=1.05296). It means that teachers feel that feedback will make the students think about their performance.

Item 14: Question-Answer

From the results it's observed that out of all the respondents, 191 (83.0%) agreed that discussion through Q&A activities leads to the development of students' critical thinking skills. The mean score of 4.2391 (SD = 0.99309) indicates that teachers feel that questioning helps the students analyze and justify their answers.

Item 15: Contextual Examples

From the obtained data the total of 192 (83.5%) respondents agreed that using contextual examples helps develop students' critical thinking skills. And the mean score of 4.3478 (SD = 0.95801) shows that teachers think students' capacity to evaluate and apply information is improved when classroom concepts are connected to real-world scenarios.

Item 16: Project-Based and Problem-Solving Activities

Results indicates that that 192 (83.5%) of the respondents agreed that project work and problem-solving help greatly in developing critical thinking skills. It is clearly showed by the average score of 4.4565 (SD= 0.92766).

Item 17: Reasoning Exercises

It is observed from the results, 194 (84.4%) respondents agreed that reasoning activities help in developing critical thinking skills. And the mean of 4.3478 (SD = 0.88701) shows that the teachers believe that the reasoning activities will be successful in improving the logical thinking and decision making of the learners. Hence Reasoning Exercises play an important role in enhancing the critical thinking of students.

Item 18: Writing Assignments and Essays

From the all participants the total number of those who strongly agree is 191 (83.0%). This can indicates that the mean of 4.2391 (SD = 1.02341) shows that the teacher sees the value in giving the students assignments that require organizing thoughts and putting down logic arguments.

Item 19: Inquiry-Based Tasks

From all respondents 194 (84.4%) participants agreed that inquiry-based tasks play an important role in developing students' critical thinking skills. And the mean score of 4.2739 (SD = 0.96611) indicates that teachers believe inquiry-based learning encourages students to investigate problems, evaluate evidence, and develop independent thinking.

Item 20: Collaborative Work

According to the obtained data it is observed that, 192 (83.5%) participants found that collaborative learning supports foster critical thinking skills among students. With an average score of 4.4217 (SD=1.00673), the teachers feel strongly that collaborative learning helps foster the exchange of ideas and different perspectives and thus critical thinking.

Table: 8 to rank the most effective pedagogical practices

S.No	To rank Most effective Pedagogical Practices	Frequency S.A+A	%	Mean	Std.D
21	Storytelling, lectures and class discussions are	176	76.5%	4.0913	1.42817
22	Oral presentations and debates	135	58.7%	3.5652	1.14175
23	Constructive feedback	139	60.5%	3.7174	1.09511
24	Question-Answer	136	59.2%	3.6391	1.00880
25	Case-based learning	130	56.5%	3.5478	3.5478
26	Project-based learning and problem-solving	107	46.6 %	3.3217	1.16760
27	Generalizing and Specifying reasoning tasks	120	52.2%	3.5913	1.11673
28	Writing assignments, essays	139	60.4%	3.7130	1.25566

29	Inquiry based activities	136	59.1%	3.6304	1.19238
30	Collaborative learning	189	82.2%	4.2043	.95166

Item 21: Storytelling, Lectures, and Class Discussions

Results described that 176 (76.5%) respondents agreed that storytelling, lectures, and class discussions are effective pedagogical practices for developing critical thinking skills. And the mean score of 4.0913 (SD = 1.42817) indicates that teachers perceived this strategy as one of the most effective approaches for promoting students' critical thinking.

Item 22: Oral Presentations and Debates

It is clearly explained by the responses that total 135 (58.7%) respondents agreed with the item that oral presentations and debates are effective in developing critical thinking skills. And the mean score of 3.5652 (SD = 1.14175) suggests that teachers moderately perceived this strategy as effective in encouraging students to express and evaluate ideas critically.

Item 23: Constructive Feedback

It is clearly observed by the results that total that 139 (60.5%) respondents believed constructive feedback is an effective pedagogical practice for enhancing critical thinking. The mean score of 3.7174 (SD = 1.09511) indicates that teachers considered timely and constructive feedback helpful in improving students' reflective and analytical thinking.

Item 24: Question-and-Answer

The results show that 136 (59.2%) respondents affirmed that question-answer method develops critical thinking of students. The mean of 3.6391 (SD = 1.00880) shows a positive perception of teachers concerning questioning in fostering critical thinking of students.

Item 25: Case-Based Learning

In item 25 it is revealed from the findings that a total of 130 (56.5%) participants agreed that case-based learning as an effective pedagogical practice for developing critical thinking. The value 3.5478 shows that teachers appreciated the use of realistic cases in stimulating critical thinking among their students to some degree. And the SD is 3.5478.

Item 26: Project-Based Learning and Problem-Solving

In item 26 the findings reveal that 107 participants out of 230, representing 46.6% of the total number, considered the use of project-based learning and problem solving as an effective teaching

method. And the mean value of 3.3217 (SD=1.16760), this practice yielded the least mean among the rest of the teaching methods.

Item 27: Generalizing and Specifying Reasoning Tasks

In item 27 the result shows that 120 (52.2%) of the respondents felt that the use of reasoning exercises is an effective method in developing critical thinking among learners. And the mean of 3.5913 (SD = 1.11673) suggests that the reasoning exercises were found to be relatively effective by the teachers.

Item 28: Writing Assignments and Essays

Writing projects and essays are useful for fostering critical thinking, according to 139 (60.4%) respondents. And the average score of 3.7130 (SD = 1.25566) indicates that teachers thought writing exercises assisted students in organizing concepts, assessing data, and formulating logical arguments.

Item 29: Inquiry-Based Activities

The results reveal that 136 (59.1%) respondents showed that inquiry-based activities as effective in fostering critical thinking skills. This implies that the mean value of 3.6304 (SD = 1.19238) demonstrates teachers' moderate level of agreement with the statement.

Item 30: Collaborative Learning

The results indicate that there were 189 (82.2%) respondents who agree that collaborative learning is the most effective form of pedagogy in teaching critical thinking. The mean value of 4.2043 (SD = 0.95166) was the highest for all approaches used, implying that teachers felt collaborative learning to be the most effective approach in promoting critical thinking through discussion and interactions.

Findings and Results

The research involved a study of the pedagogical practices used by the secondary school teachers in the development of the critical thinking skills among students. And the results showed that the reliability level of the tool was high at 0.868 showing that the questionnaire used in the study was appropriate for collecting data.

In relation to the demographic variables, most of the respondents were males (53.5%) and females represented 46.5% of the total respondents. In addition, many respondents had teaching experience between 6-10 years (40.0%), followed by teachers with 1-5 years of experience (26.5%). Also, more than half of the respondents (53.9%) had Master's Degree, and 33.9% of the respondents had M.Phil or above which shows that the participants were academically well qualified. As far as teacher designation is concerned, JESTs constituted the largest category (38.7%), then ESTs (29.6%), HSTs (16.1%), and SSTs (15.7%).

The findings addressing the first research objective, it can be concluded that teachers usually apply several types of learner-centered pedagogical practices. Teamwork and cooperative learning were found to be the most prevalent strategy (92.2%; M = 4.5522), next were writing reflective essays (90.9%) and small-scale inquiry-based tasks (90.8%). Despite low consensus rates for storytelling and discussions (73.5%), the latter were still considered to be among the common teaching practices.

With respect to the second objective, teachers had very positive feelings about the use of pedagogical practices in the process of nurturing critical thinking among learners. The practices of reasoning and inquiry had the greatest degree of agreement (84.4%), while the practices of project-based and problem solving received the highest mean (M = 4.4565) followed by collaboration (M = 4.4217). Indeed, all pedagogical practices were highly scored with mean indicating that teachers felt their role in critical thinking was great.

In regard to the third objective, collaborative learning was regarded as the best teaching approach for promoting critical thinking skills by teachers (82.2%, M = 4.2043), while storytelling, lecture and classroom discussion came second (76.5%). Project-based learning and problem solving got the lowest rating (46.6%, M = 3.3217). It means that teachers considered it important but somehow ineffective compared to other approaches.

Conclusions

Conclusively, the research demonstrates that secondary teachers commonly use a variety of pedagogical approaches that are learner centered within their teaching sessions. Some of the common pedagogical approaches included collaborative learning, reflective writing, ongoing feedback, inquiries, and reasoning. The teachers also strongly believed that these pedagogical approaches help to develop critical thinking skills through analysis, reflection, cooperation, and problem solving. Collaborative learning was found to be the most effective pedagogical practice to enhance critical thinking out of all the educational approaches. Even though both project-based learning and problem solving were considered good methods to develop critical thinking skills, they ranked lower in terms of effectiveness, thereby calling for more effort from both teachers and students in this regard. Generally, the results reveal that learner-centered pedagogical strategies are necessary in order to improve critical thinking among secondary school learners and need to be encouraged in classroom instruction.

Recommendations

The following recommendations are made on the basis of findings of the research.

- The secondary school teachers need to utilize more learner-centered teaching strategies such as collaborative learning, inquiry, reasoning, and reflective writing to improve critical thinking of students.

- Professional development and training sessions must be conducted by the school administration for teachers in order to equip them with the ability to teach through effective teaching strategies.

- Curriculum developers need to include inquiry-based, collaborative, reasoning and reflective activities in order to give students more chance of developing higher order thinking skills.

- It would be good for teachers to consider using project-based learning and problem solving in class, because these methods possess a lot of potential in critical thinking development despite having low effectiveness ratings.

- Instructional authorities need to ensure that the requisite teaching resources are available in order for learner-centered teaching methods to be successfully applied.

- Future researchers are invited to do similar studies in other districts or provinces, with larger samples, maybe also use mixed-methods or experimental designs, so they can dig deeper into how pedagogical practices connect to students' critical thinking growth.

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