



## **EXPLORE STRATEGIES FOR FOSTERING CRITICAL THINKING SKILLS AMONG STUDENTS AT SECONDARY LEVEL**

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## ARTICLE INFO

### Keywords

Strategies, Critical thinking skill

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## ABSTRACT

This study explored strategies for fostering critical thinking skills among secondary school students, focusing on inquiry-based learning, Socratic questioning, and problem-solving activities. The research highlighted how inquiry-based learning encouraged students to ask questions, engage in self-directed research, and develop independent thinking skills. Socratic questioning provided opportunities for reasoning, reflection, and meaningful discussions, helping students construct well-informed arguments. Additionally, problem-solving activities enhanced teamwork, communication skills, and the ability to apply theoretical knowledge to real-world situations, making students more adaptable and resourceful. The study was conducted among secondary-level students, with a total population of 970 students, from which a sample of 276 students was selected using a simple random sampling technique. Data were analyzed using means and percentages, providing insights into students' engagement with critical thinking strategies and the effectiveness of different instructional approaches. The findings indicated that structured teaching strategies, professional teacher training, and curriculum modifications significantly contributed to students' cognitive development, reasoning abilities, and problem-solving skills. However, challenges such as a lack of teacher training, rigid curriculum structures, and insufficient classroom resources hindered the effective implementation of critical thinking instruction. The study emphasized the need for teacher training programs, a structured feedback system, and greater involvement of parents and the community to support the development of students' critical thinking skills. These findings provided valuable recommendations for educators, curriculum developers, and policymakers to enhance critical thinking instruction at the secondary school level.

## INTRODUCTION

Critical thinking was characterized as the capacity to analyze, evaluate, and synthesize information in an intelligent and logical (Alsaleh, 2020). It included addressing suspicions, inspecting proof, and considering different points of view before deciding. These skills were crucial for navigating the intricacies of modern life and prevailing in both scholarly and professional conditions. In any case, traditional educational practices, which often stressed repetition memorization and latent learning, may not have adequately advanced the improvement of critical thinking skills (Brookfield, 2012). In numerous secondary schools, the emphasis remained on state-sanctioned testing and educational plan inclusion, leading to a climate where students were not challenged to think critically or independently. This distinction between teaching practices and the need for critical thinking raised concerns among educators, policymakers, and scientists (LoBue, 2023). The growing emphasis on preparing students for a rapidly changing world led to a renewed interest in developing strategies to improve critical thinking in educational settings. Researchers argued that critical thinking was not simply a natural talent but a skill that could be cultivated through targeted instructional methods (Chu, Reynolds, Tavares, Notari & Lee, 2021). Approaches, such as inquiry-based learning, problem-based learning, and collaborative learning, were highlighted as effective strategies for advancing critical thinking among students (Worachak, Damnoen, Hong & Putri, 2023). These methods encouraged students to engage actively with content, explore diverse perspectives, and apply their knowledge to real-world problems. In addition, the integration of technology in education offered new opportunities to cultivate critical thinking. For example, flipped classrooms, where students were exposed to new content outside the classroom and participated in critical discussions during class time, were shown to enhance critical thinking skills (Weng, Chiu & Tsang, 2022). Despite these promising strategies, the implementation of critical thinking instruction in secondary education remained inconsistent. Many educators faced challenges in adopting new teaching methods, such as lack of training, insufficient resources, and resistance to change (Tathahira, 2020). There was a pressing need to explore and identify effective strategies that could be plausibly integrated into the secondary school curriculum to foster critical thinking skills in students. Digital tools and resources could create interactive learning environments that stimulated students' intellectual capacities and encouraged further engagement with the material (Liang & Fung, 2021). By exploring various instructional methodologies and their impact on critical thinking development, this study aimed to

provide educators with evidence-based practices that could be adapted to different educational settings. The ultimate goal was to equip secondary school students with the critical thinking skills essential for success in higher education, the workforce, and lifelong learning.

## Material and Methods

In this study quantitative research approach was used to plan the overall study. A quantitative approach descriptive method was used to conduct the research. In descriptive method cross sectional survey technique was used to collect the data from the respondents. All the students of Secondary level in city kotli AJ&K were the population of the study. Total 970 students of secondary level were selected as the population of the study. Two hundred and seventy six students were selected as the sample of the study by using simple random sampling technique. The Inquiry-Based Learning Scale was used to measure the extent to which inquiry-based activities encourage students to think critically. Socratic Questioning Scale was used to assess how effectively Socratic questioning techniques are used to provoke deep thinking and reflection and third Problem-Solving Activities Scale was used to evaluates the role of problem-solving tasks in promoting teamwork, confidence, and critical thinking skills. Five point Likert scale was used to gather data from the respondents. The questionnaire was validated by two experts from the department of education, University of Kotli Azad Jammu and Kashmir. For the purpose of pilot testing the questionnaire distributed among 30 secondary school students who were not the part of the final survey. The purpose of pilot testing was to check the readability and reliability of the instrument. The reliability of the instrument was measured through Cronbach's Alpha statistical technique with the help of SPSS version 22 to measure the instruments' reliability. The value was 0.74 which was acceptable. The researcher personally visited all the Secondary schools of city Kotli AJ&K and collected the data. Statistical package for social science software (SPSS) used for the analysis of data. The researcher applied percentage and mean for the analysis of data.

## Results

**Table 4.1 My teachers encourage me to ask questions during lessons**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	10	27	16	131	92	3.97	1.211
Percentage		3.3	9.0	5.3	49.7	30.7		

Table 4.1 indicates that 81 % (30.7% SA+49.7 A) of students agreed with the statement

that my teachers encourage me to ask questions during lessons. Moreover, mean score 3.97 and SD 1.211 of students also show that they agree with the statement.

**Table 4.2 I am given opportunities to explore topics on my own through research-based activities**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	13	24	12	147	80	3.94	1.008
Percentage		4.3	8.0	4.0	54.0	26.7		

Table 4.2 indicates that 80.7 % (26.7% SA+54.0% A) of students agreed with the statement that I am given opportunities to explore topics on my own through research-based activities Moreover, mean score 3.94 and SD 1.008 of students also show that they agree with the statement.

**Table 4.3 Inquiry-based learning helps me develop skills like critical thinking and problem-solving**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	8	22	9	141	96	4.06	.939
Percentage		2.7	7.3	3.0	53.0	32.0		

Table 4.3 indicates that 85 % (32.0% SA+53.0% A) of students agreed with the statement that Inquiry-based learning helps me develop skills like critical thinking and problem-solving. Moreover, mean score 4.06 and SD .939 of students also show that they agree with the statement.

**Table 4.4 I feel more engaged when I participate in activities where I find solutions to real-life problems**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	8	43	3	128	94	3.95	1.066
Percentage		2.7	14.3	1.0	47.7	31.3		

Table 4.4 indicates that 79% (31.3% SA+47.7% A) of students agreed with the statement that I feel more engaged when I participate in activities where I find solutions to real-life problems. Moreover, mean score 3.95 and SD 1.066 of students also show that they agree with the statement.

**Table 4.5 My teachers ask thought-provoking questions that make me think deeply about the topic**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	12	18	4	136	106	4.10	.980

<b>Percentage</b>		4.0	6.0	1.3	51.3	35.3		
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Table 4.5 indicates that 86.6% (35.3% SA+51.3% A) of students agreed with the statement that my teachers ask thought-provoking questions that make me think deeply about the topic. Moreover, mean score 4.10 and SD .980 of students also show that they agree with the statement.

**Table 4.6 Class discussions encourage me to express my opinions and challenge others' viewpoints respectfully**

Responses	N	SDA	DA	N	A	SA	Mean	SD
<b>Frequency</b>	276	15	36	2	126	97	3.94	1.123
<b>Percentage</b>		5.0	12.0	.7	49.0	32.3		

Table 4.6 indicates that 81.2 % (32.3 SA+49.0% A) of students agreed with the statement that I feel shy when I have to speak English in front of others. Moreover, mean score 3.94 and SD 1.123 of students also show that they agree with the statement. **Table 4.7 I learn better when teachers guide me with questions instead of giving direct answers**

Responses	N	SDA	DA	N	A	SA	Mean	SD
<b>Frequency</b>	276	14	31	3	139	89	3.95	1.078
<b>Percentage</b>		4.7	10.3	1.0	53.0	29.7		

Table 4.7 indicates that 82.7% (29.7% SA+53.0% A) of students agreed with the statement that I learn better when teachers guide me with questions instead of giving direct answers. Moreover, mean score 3.95 and SD 1.078 of students also show that they agree with the statement.

**Table 4.8 Socratic questioning helps me reflect on what I know and what I need to learn further**

Responses	N	SDA	DA	N	A	SA	Mean	SD
<b>Frequency</b>	276	10	24	4	137	101	4.07	.884
<b>Percentage</b>		3.3	8.0	1.3	52.7	33.7		

Table 4.8 indicates that 86.4 % (33.7% SA+52.7% A) of students agreed with the statement that Socratic questioning helps me reflect on what I know and what I need to learn further. Moreover, mean score 4.07 and SD .884 of students also show that they agree with the statement.

**Table 4.9 My teachers assign tasks where we need to solve real-world problems**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	89	124	2	36	25	2.16	1.246
Percentage		31.7	45.3	.7	12.0	8.3		

Table 4.9 indicates that 79 % (33.7% SDA, 45.3% DA) of students Strongly Disagreed with the statement that My teachers assign tasks where we need to solve real-world problems. Moreover, mean score 2.16 and SD 1.246 of students also show that they agree with the statement.

**Table 4.10: Working on Group Problem-Solving Tasks Improves My Teamwork and Communication Skills**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	18	38	9	117	94	3.85	1.171
Percentage		6.0	12.7	3.0	47.0	31.3		

Table 4.10 indicates that 78.3% (31.3% SA+47.0% A) of students agreed with the statement that working on Group Problem-Solving Tasks Improves My Teamwork and Communication Skills. Moreover, mean score 3.85 and SD 1.171 of students also show that they agree with the statement.

**Table 4.11: Confidence in Thinking Ability after Problem-Solving Activities**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	12	47	10	123	84	3.81	1.127
Percentage		4.0	15.7	3.3	49.0	28.0		

Table 4.11 indicates that 77 % (28.0% SA+49.0% A) of students agreed with the statement that Confidence in Thinking Ability After Problem-Solving Activities. Moreover, mean score 3.81 and SD 1.127 of students also show that they agree with the statement.

**Table 4.12: Preference for Brainstorming Solutions over Memorizing Facts**

Responses	N	SDA	DA	N	A	SA	Mean	SD
Frequency	276	21	33	11	122	89	3.83	1.174
Percentage		7.0	11.0	3.7	48.7	29.7		

Table 4.12 indicates that 78.4% (29.7% SA+48.7% A) of students agreed with the statement that Preference for Brainstorming Solutions over Memorizing Facts. Moreover, mean score 3.83 and SD 1.174 of students also show that they agree with the statement.

**Table 4.13: Opportunities to Develop Critical Thinking Skills**

Responses	N	SDA	DA	N	A	SA	Mean	SD
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<b>Frequency</b>	276	90	100	5	21	60	2.42	1.507
<b>Percentage</b>		34.0	37.3	1.7	7.0	20.0		

Table 4.13 indicates that 71.3% (34.0% SDA+37.3% DA) of students Strongly Disagreed with the statement that Opportunities to Develop Critical Thinking Skills. Moreover, mean score 2.42 and SD 1.507 of students also show that they agree with the statement.

**Table 4.14: Impact of Teachers' Strategies on Independent Thinking**

<b>Responses</b>	<b>N</b>	<b>SDA</b>	<b>DA</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>SD</b>
<b>Frequency</b>	276	8	21	11	139	97	4.09	.956
<b>Percentage</b>		2.7	7.0	3.7	51.3	35.3		

Table 4.14 indicates that 86.6 % (51.3% SA+.3% A) of students agreed with the statement Impact of Teachers' Strategies on Independent Thinking. Moreover, mean score 4.09 and SD .956 of students also show that they agree with the statement.

## Discussion

The findings suggest that most students feel encouraged by their teachers to ask questions and engage in independent research, creating an active learning environment that fosters critical thinking. They believe that inquiry-based learning, especially through real-life problem-solving tasks, has strengthened their analytical and problem-solving skills. Many students also recognize that such activities improve teamwork, communication, and confidence in their thinking abilities. However, some students feel that their learning experiences do not always connect with real-world problems, indicating a gap between their expectations and teaching strategies. Overall, students appreciate their teachers' efforts in promoting independent thinking and inquiry-based learning. The findings highlight the positive role of teachers in fostering an inquiry-based learning environment where students feel encouraged to ask questions and engage in independent research. Students expressed confidence in this approach, noting that real-life problem-solving tasks and guided inquiry enhanced their critical thinking and problem-solving skills. Furthermore, problem-solving activities were linked to improved teamwork, communication, and confidence in their thinking abilities. However, challenges emerged in aligning teaching strategies with real-world applications, as many students felt that assigned tasks lacked relevance to practical problems. Despite this, teacher interactions were generally perceived as beneficial in promoting independent thinking and intellectual growth.



## Conclusions

The conclusions suggest that using different teaching strategies, like inquiry-based learning and Socratic questioning, encourages students to think critically and understand the material better. When students are invited to ask questions, explore answers, and participate in open classroom discussions, they learn to value different opinions and improve their understanding through collaboration. Moreover, engaging in problem-solving activities—especially those that simulate real-life challenges—not only builds confidence but also shows students the practical value of what they learn. Regular feedback and support from both teachers and peers further sharpen their critical thinking skills and academic performance. Generally, creating a positive and interactive learning environment with varied instructional methods prepares students for real-world problems and helps them succeed academically.

In summary, using inquiry-based learning encouraged students to think critically by asking questions and finding answers on their own, which improved their focus and understanding. Socratic questioning in discussions also helped develop critical thinking by allowing students to share their ideas, respect different viewpoints, and learn from one another. Problem-solving activities, especially those related to real-life challenges, promoted teamwork and made learning more meaningful, boosting students' confidence and academic performance. Teachers' feedback and support were essential in guiding students to think critically and improve their learning process. Combining inquiry-based learning, Socratic questioning, and problem-solving made lessons more engaging and effective, leading to better academic outcomes. Additionally, group work helped students understand concepts better, and a positive classroom environment with open communication and feedback further enhanced critical thinking. In general, using different teaching approaches, including inquiry-based learning and peer collaboration, prepared students for real-world challenges and improved their confidence and success.

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