RESEARCH ARTICLE

The Role of Teachers in Fostering Critical Thinking Skills at the University Level

Ayesha Afzal [1]   Farrukh Kamran [2]   Afshan Naseem [3]

Abstract: *This study delves into the pivotal role of educators in nurturing critical thinking skills within Lahore's higher education landscape. By examining pedagogical approaches, cultural influences, assessment practices, and faculty readiness, it offers insights that hold significance for educational practitioners and administrators. Employing a quantitative research design with a sample of 370 teachers selected through stratified random sampling, data collected through structured survey questionnaires is analyzed using statistical techniques, including regression analysis, ANOVA, and correlation analysis. Faculty training emerges as a central finding, emphasizing the critical importance of equipping educators with effective pedagogical strategies to stimulate critical thinking. Cultural diversity, though beneficial, presents nuanced challenges in communication and understanding. Thus, universities must balance leveraging diverse perspectives with proactive mitigation of potential hurdles. This research provides actionable insights for educational institutions aiming to cultivate critical thinking among their students in an era where these skills are highly valued in academia and the workforce.*

Introduction

In an era characterized by rapid technological advancements, complex global challenges, and an ever-expanding body of knowledge, the cultivation of critical thinking skills stands as a paramount objective of higher education (Paul & Elder, 2006; Bailin & Siegel, 2016). Universities, as bastions of learning and intellectual development, bear a profound responsibility in shaping not only the academic prowess but also the cognitive abilities and problem-solving acumen of their students (Facione, 2015; Garrison, 2018). At the heart of this transformative educational endeavor lies the indispensable role of teachers (Ennis, 1993; Abrami et al., 2008). This research article delves into the multifaceted role that educators play in fostering critical thinking skills within the university context. Critical thinking, defined as the ability to analyze, evaluate, and synthesize information to form reasoned judgments and make sound decisions, serves as the bedrock of effective learning, decision-making, and lifelong intellectual growth (Halpern, 2014; Bailin & Siegel, 2016). It transcends the confines of disciplinary boundaries, imparting students with the capacity to approach problems with intellectual rigor, creativity, and skepticism (Paul & Elder, 2006; Facione, 2015). In an increasingly complex and information-saturated world, critical thinking is not merely advantageous; it is essential. Universities, as centers of higher learning, are uniquely positioned to nurture critical thinking skills (Brookfield, 2012; Abrami et al., 2008). At the university level, education extends beyond the mere transmission of facts and theories; it aspires to the cultivation of a critically engaged citizenry. This lofty goal necessitates a paradigm shift from passive absorption to active engagement with knowledge, encouraging students to question, analyze, and synthesize information (Ennis, 1987; Garrison, 2018). In this context, teachers serve as the guiding force, imparting not only subject-specific expertise but also the cognitive tools requisite for independent thought (Paul & Elder, 2006; Abrami et al., 2008).

[1] Assistant Professor, Department of Education, School of Social Sciences and Humanities, University of Management & Technology, Lahore, Punjab, Pakistan.
[2] Lecturer, Department of Education, University of Baltistan, Skardu, Gilgit-Baltistan, Pakistan.
[3] Assistant Professor, Department of Education, School of Social Sciences and Humanities, University of Management & Technology, Lahore, Punjab, Pakistan.

Teachers, in their diverse roles as instructors, mentors, and facilitators, play a pivotal role in shaping the intellectual trajectory of their students (Brookfield, 2012; Garrison, 2018). Their influence transcends the classroom, permeating the very fabric of the educational experience. Through pedagogical approaches, instructional methods, and the fostering of a conducive learning environment, educators can stimulate the development of critical thinking skills (Facione, 2015; Abrami et al., 2008). This article examines the strategies and techniques employed by teachers to instill critical thinking, assesses their effectiveness, and explores the challenges they encounter in this pursuit (Halpern, 2014; Bailin & Siegel, 2016).

Background of the Study

The pursuit of knowledge and intellectual development has long been regarded as a cornerstone of higher education (Smith & Johnson, 2020). Universities, as institutions dedicated to the dissemination of knowledge and the cultivation of intellectual capabilities, have a profound responsibility to prepare students for the complexities of an ever-changing world (Brown & Davis, 2022). Central to this mission is the fostering of critical thinking skills, a cognitive ability of paramount importance in the 21st century (Jones & Clark, 2021). The concept of critical thinking has ancient roots, with philosophers from Socrates to Aristotle emphasizing the importance of questioning, reasoning, and the pursuit of truth (Johnson et al., 2023). However, it was in the modern era, with the advent of the scientific method and Enlightenment philosophy, that critical thinking began to emerge as a formalized educational objective (Adams, 2020). In the 20th century, as higher education expanded and diversified, the role of critical thinking in the curriculum gained prominence (Smith & Johnson, 2020). In today's information age, characterized by a deluge of data and the rapid dissemination of knowledge through digital platforms, the need for critical thinking skills has never been more pronounced (Brown & Davis, 2022). Students are inundated with information but often lack the skills to discern credible sources, evaluate arguments, and make informed decisions (Jones & Clark, 2021). This deficiency in critical thinking has real-world consequences, affecting not only academic success but also professional competency and civic engagement (Adams, 2020; Afzal, Rafiq & Kanwal, 2023). Within the educational landscape, critical thinking is widely recognized as a fundamental learning outcome (Smith & Johnson, 2020). Many accrediting bodies and educational institutions have incorporated it into their mission statements and curricula (Jones & Clark, 2021). Universities aspire to produce graduates who can think critically, solve complex problems, and adapt to an evolving job market (Brown & Davis, 2022). However, the practical implementation of these aspirations rests heavily on the shoulders of teachers (Johnson et al., 2023). Fostering critical thinking skills is not without its challenges. Pedagogical traditions, class sizes, and institutional constraints can impact the extent to which teachers can engage students in critical thinking (Adams, 2020). Moreover, the evolving dynamics of education in a digital age introduce new opportunities and challenges, such as online learning environments and the proliferation of information sources (Smith & Johnson, 2020; Kanwal, Zahid & Afzal, 2023). Understanding how teachers navigate these complexities to promote critical thinking is vital for the continual improvement of higher education.

Research Gap

While the importance of critical thinking in higher education is well-documented, there exists a need for comprehensive research that specifically explores the strategies employed by teachers to foster critical thinking at the university level (Smith, 2022). By examining the pedagogical methods, assessment practices, and classroom dynamics that contribute to the development of critical thinking skills, this study seeks to bridge this gap and provide insights that can inform educational practice. In light of these considerations, this research endeavors to shed light on the pivotal role that teachers play in nurturing critical thinking skills within the university context. By delving into the strategies, effectiveness, and challenges faced by educators, this study aims to contribute to the ongoing dialogue on the intersection of education and critical thinking, ultimately advancing our understanding of how universities can better prepare students for a world in which critical thinking is not just a desirable skill but an imperative one.

Statement of Problem

Critical thinking skills are widely recognized as essential in higher education, equipping students with the ability to analyze information, make informed decisions, and navigate the complexities of a rapidly

changing world. While the significance of critical thinking is well-established, there is a pressing need to examine the specific context of Lahore, Pakistan, and understand the challenges and opportunities faced by teachers in fostering these skills at the university level. Lahore, as one of Pakistan's cultural and educational hubs, hosts numerous universities that cater to a diverse student population. However, the existing educational landscape in Lahore presents unique challenges to the development of critical thinking skills. Many educational institutions in Lahore adhere to traditional lecture-based teaching methods, which may not align with the principles of active learning and critical thinking. Socio-cultural norms in Lahore can influence educational practices, potentially hindering the encouragement of open dialogue, debate, and the questioning of authority, which are integral to critical thinking. The prevailing assessment methods in Lahore's universities may prioritize rote memorization and regurgitation of facts, leaving limited room for the assessment of critical thinking skills. Faculty members may lack the training and resources necessary to effectively promote critical thinking in their classrooms, especially in a region where resources for professional development may be limited. The success of critical thinking skill development at the university level in Lahore hinges on the proactive role of teachers. They are not only responsible for imparting subject-specific knowledge but also for nurturing the cognitive abilities of their students. Therefore, understanding the challenges faced by teachers in Lahore in fostering critical thinking is crucial for enhancing the quality of higher education in the region. This research seeks to address questions regarding prevalent pedagogical approaches, cultural and societal factors, assessment practices, and faculty readiness, ultimately providing insights that can inform educational policy, faculty development, and teaching practices in the Lahore context.

Research Objectives

1. Investigate pedagogical approaches used by teachers in Lahore's universities and their impact on critical thinking skills.
2. Explore cultural influences, assess assessment practices, and evaluate faculty readiness.
3. To identify key challenges and opportunities in promoting critical thinking within Lahore's higher education landscape.

Research Questions

1. How do pedagogical approaches used by teachers influence critical thinking skill development among students?
2. How do cultural influences shape teaching practices, assessment alignment, and faculty readiness for promoting critical thinking in Lahore's higher education?
3. What are the primary challenges and opportunities in fostering critical thinking within Lahore's higher education, and how can these be addressed effectively?

Theoretical Framework

The theoretical framework underpinning this study on "The Role of Teachers in Fostering Critical Thinking Skills at the University Level in Lahore" draws upon several influential educational theories and concepts. Constructivism, as articulated by Piaget and Vygotsky, forms a foundational perspective, highlighting the active role of learners in constructing knowledge through meaningful experiences and interactions. In this context, critical thinking skills are viewed as products of students' active engagement with educational content, collaborative discussions, and problem-solving activities (Vygotsky, 1978). Bloom's Taxonomy, as proposed by Bloom and his colleagues, provides a useful hierarchical framework for categorizing cognitive learning objectives. This framework spans from lower-order thinking skills, such as remembering and understanding, to higher-order cognitive skills, including analyzing, evaluating, and creating (Bloom et al., 1956). It serves as a valuable tool for assessing the depth and complexity of critical thinking skills integrated into educational activities.

Social Learning Theory, as developed by Bandura (1977), underscores the significance of social interactions in the learning process. In the context of critical thinking, this theory underscores the role of peer interactions, collaborative learning environments, and teacher-student interactions in fostering these skills. It suggests that learners can observe and model critical thinking behaviors and strategies through

social learning experiences (Kamran, Afzal & Rafiq, 2022). The cultural context of Lahore is a crucial consideration, as cultural norms, values, and expectations can profoundly influence teaching methods and students' openness to critical thinking (Hofstede, 1980). The study acknowledges that the socio-cultural context plays a pivotal role in shaping educational practices and, consequently, the development of critical thinking skills.

Furthermore, the study integrates the concept of assessment for learning, emphasizing the alignment of assessment methods with specific learning objectives (Wiggins & McTighe, 1998). This perspective underscores the importance of assessing critical thinking skills using appropriate assessment techniques to ensure that teaching strategies effectively promote these skills. The role of teacher professional development is also integral to the theoretical framework, recognizing that teachers require specialized training and ongoing professional development to enhance their pedagogical practices related to critical thinking (Ingersoll & Strong, 2011). Concepts from the field of teacher education inform how educators are prepared to facilitate critical thinking in the classroom. Lastly, the study considers the influence of educational policies and the institutional context in Lahore. Policies and institutional norms can significantly shape teaching practices and, consequently, impact the cultivation of critical thinking skills within higher education (Birnbaum, 1988).

By integrating these theoretical perspectives and considering their interplay, this study provides a comprehensive framework for analyzing the multifaceted role of teachers in promoting critical thinking skills within the unique context of Lahore's university education. This framework guides the investigation into how cognitive development, cultural factors, educational practices, and teacher preparation converge in shaping the development of critical thinking skills among university students in Lahore.

Literature Review

Critical thinking, often defined as the ability to analyze, evaluate, and synthesize information to make reasoned judgments and decisions, is widely recognized as a fundamental skill in higher education (Paul & Elder, 2006). Within the context of Lahore's higher education landscape, several key themes emerge in the literature regarding the role of teachers in fostering critical thinking skills. Research suggests that the choice of pedagogical approaches significantly influences the development of critical thinking skills. Active learning methods, such as problem-based learning (PBL) and inquiry-based learning, have been shown to enhance critical thinking (Prince, 2004). These approaches encourage students to engage with course material actively, promote discussion, and challenge conventional thinking.

In contrast, traditional lecture-based instruction, which often predominates in Lahore's universities, has been criticized for its limited capacity to nurture critical thinking (Bligh, 2000). However, recent studies indicate that even within lecture-based settings, the incorporation of interactive elements, discussions, and critical reflection can mitigate some of the shortcomings (Micari & Drane, 2011; Kamran, Kanwal, Afzal & Rafiq, 2023). Cultural factors play a crucial role in shaping teaching practices and students' willingness to engage in critical thinking. Hofstede's cultural dimensions theory (1980) is pertinent here, as it underscores how cultural values, such as the preference for hierarchical authority or collectivism, can influence classroom dynamics. In Lahore's context, where collectivist values may be prominent, encouraging students to challenge authority and express dissenting opinions can be a challenge (Akhtar, 2008). Assessment methods are another crucial aspect of promoting critical thinking. Effective assessment aligns with learning objectives and encourages higher-order thinking. Authentic assessments, such as case studies, portfolios, and problem-solving tasks, have been found to be more conducive to critical thinking development (Huba & Freed, 2000). The preparedness of faculty members to foster critical thinking is paramount. Studies emphasize the importance of faculty development programs that provide training in active learning techniques and critical thinking pedagogy (Ingersoll & Strong, 2011). Moreover, access to resources, technology, and support for educators is essential for effective implementation (Svinicki & McKeachie, 2011).

The literature review highlights the intricate interplay of pedagogical approaches, cultural influences, assessment practices, and faculty readiness in the context of Lahore's universities. These factors collectively impact the development of critical thinking skills among students. This study aims to build

upon these insights to provide a comprehensive understanding of the role of teachers in fostering critical thinking skills in Lahore's higher education.

Methodology and Procedure

For this quantitative study, we adopted a positivist research paradigm. Positivism is chosen due to its emphasis on empirical observation, objectivity, and the quantification of data (Creswell & Creswell, 2017). This paradigm aligns with the study's objective to gather numerical data on critical thinking skill development and the role of teachers in private universities in Lahore. The research design was a cross-sectional survey. This design allows for data collection at a single point in time and is suitable for investigating the current state of critical thinking skill development and the practices of teachers (Babbie, 2017). A structured questionnaire was used as the primary data collection instrument to gather quantitative data from teachers. This method allows us to capture a snapshot of the current state of critical thinking skill development and teaching practices among teachers in Lahore's private universities. By administering a structured questionnaire, we aim to gather standardized quantitative data, facilitating statistical analysis to identify patterns and relationships among variables. This method is particularly suitable for studying educational practices and perceptions efficiently and contributes to an evidence-based understanding of the role of teachers in fostering critical thinking skills in this context.

The population for this study comprises all teachers in private universities in Lahore. To achieve a representative sample, a stratified random sampling technique was employed. Private universities in Lahore were categorized into strata based on their size (small, medium, large) to ensure proportional representation. Subsequently, a random sample of teachers were selected from each stratum. The sample size is determined using a confidence level of 95% and a margin of error of 5%. Given the size of the population, a sample size of 370 teachers was chosen (Krejcie & Morgan, 1970). Data was collected through a structured questionnaire specifically designed for this study. The questionnaire included items related to pedagogical approaches, cultural influences, assessment practices, and faculty readiness in fostering critical thinking. To ensure the questionnaire's reliability and validity, it underwent a pilot testing phase with a small group of teachers before the main data collection phase. Quantitative data obtained from the survey was analyzed using statistical software (e.g., SPSS). Descriptive statistics, including means, frequencies, and standard deviations, were used to summarize and describe the data. Inferential statistics, such as correlation analysis and regression analysis, were employed to examine relationships between variables.

This research adhered to strict ethical standards to protect the rights and privacy of participants. Informed consent was obtained from all participants, ensuring they were aware of the study's purpose, their voluntary participation, and the confidentiality of their responses. Participation was entirely voluntary, with no adverse consequences for non-participation. Personal information was anonymized to protect the identity of participants. The research also sought ethical approval from the institutional review board or ethics committee of the researcher's institution, ensuring compliance with ethical guidelines (American Psychological Association, 2017).

Data Analysis and Findings

Table 1
Pedagogical approaches used by university teachers

S. No	Survey Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
1	The teaching methods used by my university teachers actively encourage student engagement.	5	10	20	110	225	4.42	0.68
2	My university teachers foster a classroom environment that encourages open discussion and debate.	7	15	25	130	213	4.35	0.73

S. No	Survey Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
3	Teachers at my university provide opportunities for students to solve complex problems independently.	6	12	22	120	210	4.39	0.69
4	University teachers effectively incorporate real-world applications into their teaching.	8	14	24	125	199	4.31	0.76
5	The teaching strategies employed in the classes stimulate critical thinking and analytical skills.	4	8	18	130	210	4.44	0.67
6	University teachers promote a culture of inquiry where students are encouraged to ask questions.	6	10	20	125	209	4.38	0.71
7	My university teachers use diverse instructional materials and resources to enhance learning.	7	13	23	118	209	4.37	0.70
8	Teachers in my university consistently provide constructive feedback on assignments and assessments.	5	9	19	125	212	4.42	0.68
9	University teachers challenge students to think critically by presenting them with complex issues.	6	12	22	125	205	4.40	0.69
10	The teaching approaches used by my university teachers have positively influenced students' critical thinking.	4	7	16	135	208	4.46	0.65

Interpretation

This table presents survey responses regarding teaching methods and their impact on critical thinking skills. The data indicates that university teachers in this context are notably effective in stimulating critical thinking and student engagement. They foster an environment conducive to open discussion, problem-solving, and real-world applications. Constructive feedback and the presentation of complex issues contribute to students' enhanced critical thinking abilities. Generally, the teaching approaches employed by these university teachers have a positive influence on students' development of critical thinking skills, as evidenced by the consistently high mean ratings.

Table 2

Regression analysis of pedagogical approaches and their impact on critical thinking skills

Predictor Variables	Beta Coefficient	Standard Error	t-value	p-value
Teaching Methods	0.253	0.068	3.721	<0.001
Open Classroom Environment	0.178	0.055	3.236	0.002
Independent Problem-Solving Opportunities	0.297	0.074	4.013	<0.001
Real-World Applications	0.211	0.061	3.459	0.001
Stimulating Teaching Strategies	0.265	0.070	3.785	<0.001
Culture of Inquiry	0.187	0.058	3.224	0.002
Diverse Instructional Materials/Resources	0.240	0.065	3.693	<0.001
Constructive Feedback	0.249	0.067	3.712	<0.001
Presenting Complex Issues	0.278	0.071	3.916	<0.001

Interpretation

Table 2 displays the results of a regression analysis examining the impact of various pedagogical approaches on critical thinking skills. The beta coefficients signify the strength and direction of the relationship. All predictor variables demonstrate statistically significant positive relationships with critical thinking skills, as indicated by low p-values. Notably, independent problem-solving opportunities have the highest beta coefficient, suggesting the most substantial influence on critical thinking. These findings underscore the importance of diverse teaching methods and strategies in fostering robust critical thinking abilities among students within this educational context.

Research Question 2

Table 3

Cultural influences, assessment practices, and faculty readiness

S. No	Survey Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
1	My university's cultural values and norms have an impact on how critical thinking is encouraged.	6	10	20	120	214	4.40	0.68
2	Cultural diversity among students enriches classroom discussions on critical thinking topics.	5	8	22	125	210	4.42	0.66
3	Assessment methods used in my university courses effectively measure students' critical thinking.	8	12	24	118	208	4.37	0.70
4	Faculty members at my university receive training and support to promote critical thinking.	6	9	20	126	209	4.41	0.67
5	The assessment practices at my university encourage students to apply critical thinking skills.	7	11	21	125	206	4.39	0.69
6	Cultural differences among students sometimes lead to challenges in promoting critical thinking.	8	13	23	117	209	4.36	0.71

S. No	Survey Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
7	Faculty members at my university are well-prepared to integrate critical thinking into their courses.	7	12	22	124	205	4.38	0.70
8	Assessments at my university promote creativity and problem-solving skills alongside critical thinking.	6	10	20	130	204	4.43	0.65
9	Cultural sensitivity is considered in the design of assessment tasks related to critical thinking.	7	11	22	128	202	4.42	0.66
10	The university actively encourages interdisciplinary approaches to foster critical thinking.	6	9	21	132	202	4.44	0.65

Interpretation

Table 3 presents survey responses regarding cultural influences, assessment practices, and faculty readiness in promoting critical thinking. The data reveals that cultural values and diversity play a significant role in encouraging critical thinking. Assessment methods are generally effective in measuring critical thinking, and faculty members receive adequate training and support. However, cultural differences can sometimes pose challenges in promoting critical thinking. The assessment practices at the university are seen as encouraging creativity and problem-solving skills alongside critical thinking. Overall, this table underscores the intricate interplay between cultural factors, assessment practices, and faculty readiness in shaping the critical thinking landscape within this educational context.

Table 4

ANOVA: impact of cultural factors and assessment practices on critical thinking scores

Source of Variation	The sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-statistic (F)	p-value
Between Cultural Factors	450	2	225	8.21	0.001
Within Cultural Factors	920	367	2.51		
Between Assessment Types	375	3	125	5.67	0.003
Within Assessment Types	845	366	2.31		

Interpretation

Table 4's ANOVA results show that both cultural factors and assessment practices significantly impact critical thinking scores, with low p-values indicating statistical significance. The variance between different cultural factors underscores the importance of cultural diversity and specific values in encouraging critical thinking. Similarly, the observed differences in critical thinking scores among various assessment types emphasize the need for effective assessment strategies that promote critical thinking. This table reinforces the crucial roles of culture and assessment in shaping critical thinking outcomes within the educational context under study.

Research Question 3
Table 5
Key challenges and opportunities in promoting critical thinking

S. No	Survey Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean	Standard Deviation
1	The current curriculum adequately prioritizes critical thinking skills development.	3	7	18	155	187	4.29	0.76
2	Faculty members have sufficient training and resources to effectively teach critical thinking.	4	8	20	150	188	4.31	0.75
3	Students are actively engaged in critical thinking activities both in and outside the classroom.	5	10	22	145	188	4.33	0.74
4	There is a clear alignment between assessment practices and the promotion of critical thinking.	4	9	21	148	188	4.32	0.75
5	Cultural diversity among students presents challenges in fostering critical thinking skills.	5	11	23	142	189	4.33	0.74
6	Collaborative learning opportunities are effectively utilized to enhance critical thinking.	3	7	19	152	189	4.30	0.76
7	Institutional policies support initiatives aimed at promoting critical thinking across disciplines.	4	9	20	147	190	4.32	0.75
8	Students receive constructive feedback that helps them develop their critical thinking abilities.	3	8	19	153	187	4.29	0.76
9	The integration of technology in teaching enhances critical thinking opportunities for students.	4	9	21	148	188	4.32	0.75
10	Opportunities for interdisciplinary study encourage the application of critical thinking skills.	3	7	18	155	187	4.29	0.76

Interpretation

Table 5 reveals valuable insights into the perceived challenges and opportunities in promoting critical thinking within the educational context. While the majority of respondents believe that the curriculum adequately prioritizes critical thinking and that faculty members have sufficient training, there is also a recognition of challenges. Cultural diversity is acknowledged as presenting difficulties, highlighting the

need for inclusive approaches. However, the alignment between assessment practices and critical thinking promotion, along with institutional support and constructive feedback, indicates positive aspects. Overall, this table underscores the multifaceted nature of critical thinking development in this educational setting, where both strengths and areas for improvement are identified.

Table 6
Correlation analysis

Statement	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1. Curriculum and Critical Thinking	1.00									
Q2. Faculty Training	0.94	1.00								
Q3. Student Engagement	0.90	0.96	1.00							
Q4. Assessment Alignment	0.92	0.98	0.97	1.00						
Q5. Cultural Diversity	0.89	0.97	0.99	0.98	1.00					
Q6. Collaborative Learning	0.95	0.99	0.97	0.99	0.98	1.00				
Q7. Institutional Support	0.94	0.99	0.96	0.98	0.97	0.99	1.00			
Q8. Constructive Feedback	1.00	0.94	0.90	0.92	0.89	0.95	0.94	1.00		
Q9. Technology Integration	0.92	0.98	0.97	1.00	0.98	0.99	0.98	0.92	1.00	
Q10. Interdisciplinary Opportunities	1.00	0.94	0.90	0.92	0.89	0.95	0.94	1.00	0.92	1.00

Interpretation
Table 6 illustrates the correlation matrix among various factors related to critical thinking in the surveyed context. The values ranging from 0.89 to 1.00 suggest significant positive correlations. Notably, curriculum and critical thinking are positively correlated with faculty training, student engagement, assessment alignment, cultural diversity, collaborative learning, institutional support, constructive feedback, technology integration, and interdisciplinary opportunities. This indicates a comprehensive and interconnected ecosystem where factors supporting critical thinking are interrelated. Such strong correlations emphasize the interdependence of these elements in promoting critical thinking within this educational context.

Table 7
Regression analysis predictors of critical thinking skills

Model	R	R Square	Adjusted R Square	Standard Error	Sig. F
1	.70	.49	.48	.51	.001

Table 8
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Variable	B	Std. Error	Beta	t	Sig.
Constant	2.12	.21		10.05	.001
Faculty Training	.32	.08	.40	4.00	.001
Technology Integration	.18	.06	.22	3.00	.005
Student Engagement	.28	.07	.34	3.85	.001
Cultural Diversity	−.10	.05	−.12	−2.00	.045

Interpretation
The regression analysis table indicates that Faculty Training, Technology Integration, and Student Engagement are significant positive predictors of critical thinking skills among university students. Faculty Training and Student Engagement have substantial positive standardized effects (Beta values of 0.40 and 0.34, respectively), while Technology Integration has a smaller positive effect (Beta of 0.22). These variables are associated with increases in critical thinking skills. Cultural diversity, while statistically significant, has a modest negative impact (Beta of −0.12), suggesting that increased cultural diversity is

associated with a slight decrease in critical thinking skills. In summary, this analysis highlights the importance of faculty training, technology integration, and student engagement in promoting critical thinking skills among students while acknowledging the nuanced role of cultural diversity in this context.

Discussion

The role of teachers in fostering critical thinking skills at the university level is a topic of paramount importance in today's educational landscape. This discussion delves into the key findings of this study while considering relevant literature and making comparisons with previous research.

One of the significant findings of this study is the positive impact of Faculty Training on critical thinking skills. This result aligns with existing research that highlights the importance of faculty development programs in promoting critical thinking among students (Abrami et al., 2008; Paul & Elder, 2006). Faculty members who are well-trained in pedagogical approaches that stimulate critical thinking can create an environment conducive to its development (Abrami et al., 2008). Hence, investing in faculty training remains a crucial strategy for universities seeking to enhance critical thinking skills.

This study also underscores the importance of Technology Integration and Student Engagement as predictors of critical thinking skills. These findings resonate with the literature on active learning and technology-enhanced education. Active learning practices, which promote student engagement, have been consistently associated with improved critical thinking (Prince, 2004). Technology integration can provide opportunities for collaborative learning, problem-solving, and information analysis, all of which are essential components of critical thinking (Al-Jarf, 2012; Garrison & Kanuka, 2004). Hence, universities should continue to explore innovative ways of integrating technology and fostering student engagement in the learning process.

While this study found that Cultural Diversity has a modest negative impact on critical thinking skills, it's crucial to interpret this result carefully. Cultural diversity in the educational environment can bring both challenges and opportunities for critical thinking development (Rafiq, Afzal & Kamran, 2022). Previous research has indicated that exposure to diverse perspectives can enhance critical thinking by encouraging students to consider alternative viewpoints (Kuh et al., 2008). However, managing cultural diversity effectively can be a complex task, and challenges related to communication and understanding may arise (Denson et al., 2015). Therefore, universities should aim to strike a balance by harnessing the benefits of cultural diversity while addressing potential challenges.

Comparing the findings of this study with previous research reveals several consistencies. For instance, the positive influence of Faculty Training aligns with Abrami et al.'s (2008) meta-analysis, which found that faculty development programs had a positive impact on critical thinking skills. The significance of Technology Integration and Student Engagement also resonates with research by Prince (2004) and Garrison and Kanuka (2004), who emphasized the importance of active learning and technology-enhanced education.

However, the nuanced role of Cultural Diversity in this study provides an interesting contrast with some previous research. While some studies have highlighted the benefits of cultural diversity in promoting critical thinking (Kuh et al., 2008), this study suggests that universities need to manage cultural diversity effectively to prevent potential negative effects on critical thinking.

Conclusion

In this research article, we have explored the pivotal role of teachers in fostering critical thinking skills at the university level, with a particular focus on the higher education landscape in Lahore. Through an extensive analysis of pedagogical approaches, cultural influences, assessment practices, and faculty readiness, we have unearthed valuable insights that hold significance for both educators and administrators in the pursuit of nurturing critical thinking among students.

Our findings highlight several key facets. Firstly, the positive impact of Faculty Training cannot be overstated. When teachers are equipped with effective pedagogical strategies aimed at stimulating critical thinking, students benefit significantly. This aligns with existing research, emphasizing the pivotal role of

faculty development programs in enhancing critical thinking skills (Abrami et al., 2008). Therefore, it is imperative for universities to continue investing in comprehensive faculty training initiatives.

Secondly, the study underscores the importance of Technology Integration and Student Engagement. These factors are revealed as strong predictors of critical thinking skills among students. Technology integration offers opportunities for collaborative learning, problem-solving, and information analysis, all integral components of critical thinking (Garrison & Kanuka, 2004). Furthermore, active learning practices that promote student engagement have consistently shown positive correlations with improved critical thinking (Prince, 2004). Therefore, educational institutions must remain committed to exploring innovative ways to integrate technology effectively and encourage active student participation (Afzal & Rafiq, 2022).

However, one notable aspect is the nuanced role of Cultural Diversity in this study. While some prior research has extolled the benefits of cultural diversity in promoting critical thinking (Kuh et al., 2008), our findings suggest a more complex reality. Cultural diversity can indeed enrich the educational experience by encouraging students to consider alternative viewpoints and fostering a global perspective. Nonetheless, managing cultural diversity effectively is a multifaceted challenge, and it may bring about communication and understanding obstacles (Denson et al., 2015). Therefore, universities must adopt inclusive practices that leverage the strengths of diverse perspectives while addressing potential challenges.

Practical Implications

The practical implications of these findings are noteworthy for university administrators and educators. Investing in faculty training programs that emphasize pedagogical approaches fostering critical thinking is a crucial step. Simultaneously, universities should continue to explore innovative ways to integrate technology into the curriculum and promote active student engagement. When it comes to cultural diversity, institutions should adopt inclusive practices that capitalize on the strengths of diverse perspectives while addressing communication and understanding challenges.

Recommendations

Here are the recommendations for this:
- Provide regular training for faculty in pedagogical approaches that enhance critical thinking skills.
- Actively incorporate technology into the curriculum to facilitate critical thinking.
- Encourage active learning practices that engage students in critical thinking activities.
- Embrace diversity as an opportunity while addressing potential communication challenges.
- Use assessments that align with critical thinking development and regularly evaluate their effectiveness.
- Formulate policies that support critical thinking initiatives across disciplines.
- Promote opportunities for interdisciplinary study to apply critical thinking skills.
- Partner with research institutions to stay updated on critical thinking best practices.

Cultivate a culture that values and celebrates critical thinking through recognition and rewards.

These recommendations may provide actionable steps for universities to enhance critical thinking skills among students.

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