

The Interplay Of Knowledge Management Between Instructional Leadership And Teacher's Critical Thinking

Sobia Bhutto¹, Dr. Al-Amin Mydin², Kamran Hyder Malik³, Faiza Qureshi⁴

¹School of Educational Studies, USM: sobia.bhutto2018@gmail.com

²School of Educational Studies, USM: alamin@usm.my

³Sukkur IBA University Pakistan: kamranhyder@iba-suk.edu.pk

⁴MUET Jamshoro, Pakistan: faiza.qureshi@faculty.mueta.edu.pk

ABSTRACT

The aim of this research is to analyze the influence of instructional leadership on the critical thinking of teachers with the mediation of knowledge management. The survey instrument was used to collect the data from the school teachers of district Sukkur by using a random sampling technique. Structural equation modeling (SEM) with AMOS was used to analyze the proposed hypothesis of the study. Results show that instructional leadership has significant influence on critical thinking. Results also demonstrates that knowledge management partially mediates the relationship between instructional leadership and teacher's critical thinking. The conclusion of the study have remarkable implications theory, policy, practice and the industry. In the end limitations of the study are also discussed.

Keywords: Instructional Leadership, Knowledge management, teachers, critical thinking, Pakistan.

Introduction

Critical thinking is the core skill of the 21st century. It is widely acknowledged that education has a crucial role in developing students' capacity to think critically and make ethical, well-reasoned decisions and assessments (Haidar & Fang, 2019; Manan & Hajar, 2022). According to Warsi (2004), Pakistani teachers at the school are mainly concerned with transferring factual knowledge instead of developing and evaluating critical thinking skills. Hoodbhoy (2009) repeatedly expresses his concern over the sad state of critical thinking, critical inquiry, and constructive reasoning in the education system. The Pakistani educational system discourages questioning and emphasizes obedience due to the country's conservative cultural and social values.

Much of the literature on critical thinking in education emphasizes schools' role in developing students' critical thinking skills (BONNEY & STERNBERG, 2016; Mao, Cui, Chiu, & Lei, 2022; Winarso & Haqq, 2020). The rationale that these studies report is that critical thinking skills enable students to be better thinkers, better truth seekers, and better decision-makers. Specifically, the classroom environment could be an effective path that helps students acquire these critical thinking skills. However, teachers use critical thinking instruction in their teaching and allow their students to be better truth seekers, creative thinkers, and critical thinkers (Ardiansyah, Kurniati, Trapsilasiwi, & Osman, 2022; Rombout, Schuitema, & Volman, 2022).

Further, Živkovič (2016) expounded that it is necessary to instill in students the critical thinking skills required for the twenty-first century to develop a thinking mind. Additionally, the NPST “National Professional Standards for Teachers in Pakistan” clearly state in standard four, “Teachers employ various developmentally appropriate strategies to promote critical thinking, problem-solving and performance skills of all learners.”

Multiple factors influence the process of developing creativity, innovativeness, and critical thinking in teachers and students. However, instructional leadership plays the most dominant role in this regard (Hackmann, Malin, & Gilley, 2018; Woodard & McDonald, 2021). Teachers' critical thinking skill is deeply interconnected with the quality of instructional leadership. They further delineate that if the instructional leadership has the will and the skill, he can enhance teachers' critical thinking to a significant level. There are two main characteristics of educational leadership; their working relationships with the staff and their technical expertise in the field. According to Muhammadiyeva, Mahkamova, Valiyeva, and Tojiboyev (2020), instructional leaders not only guide and inspire teachers to use relevant pedagogies but also helps students foster their critical thinking. The instructional leaders convey the teachers' techniques to incorporate higher-order thinking exercises in their instructions which directly prepare students with higher-order thinking skills (Hidayat, Kurniawan, Yolviansyah, Sandra, & Iqbal, 2022). The present study also examines knowledge management's mediating effect on teachers' critical thinking in teaching in the classroom. Knowledge management is a new construct in the Pakistani context, and researchers produced a few research papers in the field of business and education in Pakistan. In education, most of the studies on knowledge management focused on higher

education (University level). Knowledge management emphasizes that knowledge acquisition, refinement, storage, distribution, and presentation have become an essential research topics in recent years (Abbas & Sağsan, 2019). Knowledge Management is all about creating and managing the knowledge within the organization.

Consequently, this study has two objectives. 1. To examine how instructional leadership affects teachers' capacity for critical thinking. 2. To examine how knowledge management mediates between instructional leadership and teachers' critical thinking.

This study provides facts and findings to the policymakers on instructional leadership, and teachers' critical thinking, in encouraging teachers to use teaching strategies that promote critical thinking among students. The findings of the current study also offer instructional leaders a set of guidelines. Instructional leaders can include teachers in teaching methods that promote critical thinking by following these criteria.

Literature review

Teachers' Critical Thinking

“Reasonable reflective thinking that is focused on deciding what to believe or do” (Piaget 1976, p.23). Cognitive skills for critical thinking include induction, deduction, observation, ability to judge the credibility of information, assumptions, and meanings (MacQueeney et al., 2022; Piaget, 1976). In the present study, critical thinking improves secondary school teachers' instructional strategies, which promote critical thinking in their teaching practices in the classroom.

Comprehension

Reading comprehension is the ability to comprehend and interpret what is read. To effectively grasp written information, students should be able to (1) interpret whatever they study, (2) develop relationships between how much they learned and what they already understand, and (3) critically assess what they have reviewed. In the present study, comprehension is the ability of secondary school teachers to understand and interpret what they read and transfer the same to the students.

Analysis

The analysis breaks something into component elements to determine what they perform and how they are related. In the present study, analysis is defined as how secondary school teachers break the information

Evaluation

Evaluation is the process of gathering, analyzing, and interpreting data pertaining to any aspect of a training or educational program in terms of a recognized technique for figuring out the program's effectiveness, efficiency, and other results.

Instructional Leadership

Leadership is regarded as the social science topic that has been studied the most and is crucial to the success of every organisation. Second, a widespread conviction that good leadership is essential to corporate success and social cohesion, as evidenced in Western and Eastern classical writings (Arun & Kahraman Gedik, 2022; Filatotchev, Wei, Sarala, Dick, & Prescott, 2020).

The present study investigates the influence of instructional leadership (Hereafter IL) of secondary school principals to promote teachers' critical thinking in teaching. This type of leadership is specific to educational settings since it relates to the teaching-learning process and

focuses on enhancing student achievement (Bhengu & Blose, 2022; Philip Hallinger, 2011). In this study, IL refers to the techniques employed by school head teachers/principals to improve classroom instruction by observing and collecting data, modelling instructional practices, providing professional workshops, and offering other supports for instructional improvements to incorporate strategies that promote critical thinking among secondary school teachers. Philip Hallinger, Murphy, and Hausman (1992) identified three primary responsibilities of IL: "defining mission, managing instructional programme, and promoting a positive school climate".

Defining the school mission: This involved developing school goals and sharing them with the administration and communities. **Managing the Instructional Program:** Principals oversaw and evaluated instruction, managed the curriculum, and monitored student progress to manage the educational programme.

Positive School Learning: was created through maximising academic incentives for pupils, preserving instructional time, supporting professional development, maintaining high visibility, rewarding teachers, and enforcing academic standards.

Knowledge Management

Knowledge management is a systematic strategy to capturing, organizing, and sharing information throughout an organisation. Knowledge management emphasizes that knowledge acquisition, refinement, storage, distribution, and presentation have become an essential research topic in recent years (Abbas & Sağsan, 2019; Shahzad, Qu, Zafar, & Appolloni, 2021). The Meyer and Zack knowledge management cycle is very important in knowledge management. It is a way for an organization to turn information into knowledge. It shows how an organization

captures, processes, and shares knowledge. The steps of knowledge management are given below

Knowledge Acquisition is the method by which a group and its participants acquire the necessary information to complete their work quickly, efficiently, and economically. **Knowledge Refinement:** reviewing, analyzing, and improving knowledge so it can be saved in a repository. **Knowledge Storage:** refers to recording, either in a "soft" or "hard" format, and then retaining individual and organizational knowledge so that it may be quickly retrieved. This results in a savings of time and other organizational resources, ultimately leading to an improvement in performance. **Knowledge Distribution:** refers to disseminating and sharing information throughout different organizational levels by utilizing a wide variety of interconnected methods, people, and technologies. **Knowledge Presentation:** Knowledge must be accessible to anyone in the organization who needs it, anywhere and at any time, in a useful way. For instance, when a principal or teacher shares new information, it should be clear and easy to understand so that others can see and use it correctly.

Theoretical Framework

Hallinger and Murphy's Model

The present study would use Hallinger and Murphy's Model of IL (1990) as a guide to investigating the influence of IL on secondary school teachers' critical thinking in teaching. Hallinger and Murphy's Model of IL was also used in many past studies (Adams, Thien, Chuin, & Semaadderi, 2021; Sio & Ismail, 2019) in connection to IL. The Hallinger and Murphy (1990) model was developed on observations of principals of elementary schools and a literature evaluation of school effectiveness.

Constructivism Theory

This study also uses Constructivism theory. This theory explains how people acquire their knowledge. For constructivists, learning does not consist solely of knowledge of basic facts. However, learning is a process of generating knowledge that calls for higher-order active thinking abilities including contrasting, interpreting, integrating, assessing, and then matching new knowledge to existing experience. (Epler & Jacobs, 2022; Garzón & Castañeda-Peña, 2015). This theoretical viewpoint holds that problem-solving is the core of learning, reasoning, and development core of learning, reasoning, and development is problem-solving.

Constructivists like Bruner, Piaget, and Ausubel contend that when people participate in issue and discovering inquiry, they create their understanding since the results of their actions reflect both prior knowledge and new information. Similarly, the present study investigates the critical thinking of secondary school teachers' in teaching to enhance student higher-order thinking skills.

Relationship of IL with teacher's Critical Thinking

The idea of "IL" came from "instructional effective elementary schools" (Ahmad & Hamid, 2020)

This was explained as the school principal's role. The leaders of highly productive schools are perceived to have a strong emphasis on learning and teaching by being familiar with pedagogy, taking part in instructional, and devoting a significant amount of time to teaching activities intended to achieve school goals (Philip Hallinger, 2015; Philip Hallinger, Gümüş, & Bellibaş, 2020; Liu & Hallinger, 2018). Many past studies established that overall school effectiveness is deeply associated with IL and teachers' professional development (Carrington, Spina, Kimber, Spooner-Lane, & Williams, 2022).

Ricketts's (2005) found a correlational study was to find out if there was a link between a group of young people's leadership training and experiences and their ability to think critically in their

fields. The researcher created leadership and critical thinking measures to discover low but favourable associations between each leadership attribute and each critical thinking skill (1 leadership experience, and total leadership score). Ricketts's (2005) study only shows that there is a link between leadership and critical thinking. Due to the growing recognition of IL and teachers' competency Yusof, Ibrahim, and Rahim (2017) conducted a study to identify the relationship between virtual IL practices and teaching competency among school teachers. Data were collected through questionnaires from 352 respondents and analyzed using SEM. The results revealed that all three suggested dimensions for virtual IL and teaching competency were significant. In addition, virtual IL was found to have a considerable impact on teaching competency. Limited correlational studies on whether IL positively affects teachers' critical thinking in teaching have been previously conducted. On the base of the above discussion, the present study is proposing to investigate the influence of IL on teachers' critical thinking in teaching.

H1: There is significant influence of IL on teachers' critical thinking in teaching.

The mediating role of knowledge management between IL with teacher's Critical Thinking

Innabi and Sheikh (2007) found in Jordanian secondary schools that the teachers have not a clear understanding and definitions of critical thinking. Hoodbhoy (2009) repeatedly expresses his concerns over the pathetic state of affairs of the education system of Pakistan concerning critical thinking, critical inquiry, and constructive

reasoning. Saeed et al. (2012) emphasize the critical role of inquiry as the primary driving force behind the thinking process. They proposed that asking questions is a skill teacher should learn before giving them classes and courses that need critical thinking skills. The literature states that IL is important for enhancing the critical thinking of the teacher's. Similarly, instructional leaders can influence secondary school teachers to integrate instructional practices that promote critical thinking in students.

Further, critical thinking and knowledge management tries to fill this gap by showing how knowledge management and critical thinking are linked conceptually. A critical review was done to find out how each idea was put together and how they related to each other. The results showed that critical thinking and knowledge management are linked in three ways: relationships, process, and goals. The study by Indrašienė et al. (2021) found a association between knowledge management and critical thinking. When people learn more about critical thinking, it can lead to new ways of planning organisational strategies and training employees. There is a clear link between managing knowledge and being able to think critically. In another study, Yeh (2012) aimed at co-creation blended knowledge management to cultivate critical thinking skills in college students.

McGloughlin (2016) investigates how district administrators employ knowledge management to affect the IL performance of principals. Existing research would examine the influence of IL and knowledge management on teachers' critical thinking in teaching in the context of secondary schools in Pakistan. However, no previous study seems to have been conducted to establish mediating role of "knowledge management" between IL and teachers' critical thinking in teaching. Therefore, the present study would

provide an avenue for scholars to investigate this unique relationship. Based on the previous research, this research propose that

H2: Knowledge management mediate the influence of IL on teachers' critical thinking in teaching.

SAMPLE & PROCEDURE

Researcher collected the data from the teachers of secondary schools of District Sukkur, Sindh. A district is a region designated for administrative use or gathered together as one particular area. The Sukkur district is further divided into five smaller administrative units called Tehsils. City Sukkur tehsil has 16 secondary schools with a total number of 467 teachers. New Sukkur tehsil has 14 secondary schools with 265 teachers. Pano Akil Tehsil, taluka has 19 secondary schools and 310 teachers. Rohri tehsil has 16 secondary schools and 254 teachers. Finally, Saleh pat is the smallest tehsil which has only 11 secondary schools with 115 teachers. In this study, the 40 percentage of total population of each secondary school would be surveyed from each tehsil to produce generalizable findings. For this purpose, the 40% of the schools from each taluka would be selected.

For adopting random sampling, we followed the following steps. First, the concerned school headmaster (Principal) would be requested to furnish the school in-service teachers list. Second, each individual would be identified with the assigned numbers given by schools (Creswell, 1999, 2011). Third, every odd number (i.e., 1, 3, and 5) would be included until the desired sample is achieved (Creswell, 2011). Concerning the appropriate sample size of the study for testing the proposed hypotheses of the study, G*Power software (version 3.0.10) was used (Faul, Erdfelder, Lang, & Buchner, 2007; Kang, 2021). The power analysis for the samples-independent t-test was performed with some input parameters,

such as significance level $\alpha = 0.05$; power = 0.9; many groups = 2. The results indicated that the study would require a minimum sample of 172 study participants to reject or approve the null hypotheses of the study. However, the present study included 563 secondary school in-service teachers' sample size to produce generalizable results. All the concerned headmasters (Principals) of the secondary schools of district Sukkur would be contacted to seek their prior approval for the data collection. Moreover, the study participants were also be given a consent form in which they would be informed of the nature of the study. To gather a high response rate, all the participants would also be assured that their names would remain confidential, and they would also be given access to the findings of the study once published online. The survey forms were distributed to the randomly selected teachers in the class hours. Most of the teachers were busy in teaching their classes so researcher did not take their time and requested them to fill these questionnaire as their ease. Researcher gave them a time of one week to fill the survey forms properly and to avoid from any time error. It was also infomed to respondents that there would be no right or wrong answer, all the participants would be encouraged to respond to the questionnaire honestly and completely. The random sampling method was used to select the representative sample of this study. A total of 563 questionnaires delivered by hand to the respondent that participated in the survey. Out of 563 questionnaires, 415 questionnaires were returned. Moreover, only 295 survey forms were found useable for this research and can be considered enough for conducting factor analysis (Pallant, 2020). The school sample consisted of 212 (71.86%) males and 83 (28.14%) females and their mean age was 38.94 years ranging from 25 to 59 years. Moreover, they had a mean teaching experience of 14.53 years ranging from 1 year to 39 years.

MEASURES

Knowledge management

This study used the scale of Mayer and Zack (1996) to measure the knowledge management. A sample of items used in the scale are: “Store new knowledge in a specific folder in school computers” etc. This scale was measured on Likert scale of 5-point which was ranging from 1 (strongly agree) to 5 (strongly disagree).

Critical Thinking Questionnaire by Peter Honey

To measure the critical thinking of secondary school teachers, the survey instrument of Peter Honey’s critical thinking questionnaire (2004) was adapted in the present study. This scale was measured on five-point Likert scale ranging from never (1 point), seldom (2 points), sometimes (3 points), often (4 points), to always (5 points). An example of the item included. “I state my reasons for accepting or rejecting arguments and propositions”.

Instructional Leadership

This study adapted the PIMRS developed by Phillip Hallinger, Wang, and Chen (2013), based on a 5-point Likert scale ranging from strongly disagree to strongly agree.

FINDINGS OF THE STUDY

Initial Data Screening Analysis Results

SPSS (Statistical package for social sciences) is employed for data screening and AMOS (analysis of moment) is also used for the testing the proposed hypothesis of the study. While conducting the initial tests of data screening, researcher found some aberrant values, their values were out of the given ranges of responses,

in results, researcher deleted those aberrant values from the data. Furthermore, normality test was also run for making sure the normal distribution of the given dataset, all multivariate outliers were excluded by the researcher.

Test for Common Method Bias (CMB)

CMB (Common method Bias) affects the validity of results. In previous researches, number of techniques was employed by different researchers to minimize CMB affect which may can affect the results validity obtained from cross-sectional as well as derived data. Researcher followed the suggestions of Podsakoff, MacKenzie, Lee, and Podsakoff (2003), and make sure the clarity of questions written in questionnaire. Furthermore, researcher avoided the double barrelled questions. In addition, cover letter was provided to respondents, explaining the reason, objective of the study to the respondents. It was conveyed to respondents that their information will not be shared to any one and will be used only for this research. For ensuring the absence of CMB in the obtained data, a Harman’s single factor test was used by the researcher. The results of single factor were significant, 15.48% variance found in data which is much lower than the threshold point of 50%. The analysis and the results ensured the absence of CMB’s threat in the dataset.

Confirmatory Factor Analysis

Researcher used CFA “Confirmatory factor analysis” to refine the constructs and to find out the validity and reliability of the variables. First of all the model fitness was analyzed and it was found that model fit statistics were poor (RMSEA = .062; CMIN/df = 2.133; TLI = .717; CFI = .725,). All the items were deleted who has low factor loadings (i.e., < .50). The specified model was ran again and model shows the acceptable fit indices such as RMSEA (.045), CMIN/df = 1.23; TLI (.938), and CFI (.923)

Reliability and Validity

Hair et al. (2010), has explained the criteria of reliability and validity. According to him, a scale is reliable when its composite reliability is greater than 0.70. Scale has convergent validity when AVE “average variance extracted” is less than

0.50 and discriminant validity occurs when MSV “maximum shared squared variance” should be less than AVE. The values given in table 01 shows the accepted level of reliability and validity of all the constructs.

Table 01: Reliability and validity of constructs

	CR	AVE	MSV
Instructional Leadership	0.938	0.524	0.327
Knowledge Management	0.861	0.557	0.154
Critical Thinking	0.931	0.510	0.327

Correlation values among variables

To examine the association between the factors, the correlation test is utilized. According to Pallant (2020), the correlation value ranges from ± 1.0 to 0, with a correlation value of 0 indicating no link between the two variables and a value of ± 1

0 indicating a perfect negative or positive association. Table 02's findings show the correlations between the study's variables. The results depict that IL has significant association with critical thinking ($r = 0.607^{**}$; $p < .01$), and knowledge management also has significant association with critical thinking ($r = 0.431^{**}$; $p < .01$).

Table 02: Correlations summary

	1	2	3
1. Instructional Leadership	1		
2 Knowledge Management	.421 ^{**}	1	
3. Critical thinking	.607 ^{**}	.431 ^{**}	1

Tests of Hypotheses

Researcher employed a unique approach and used SEM also for the testing of hypothesis through structural regression, in addition with its use for confirmatory factor analysis. SEM got many advantages and biggest among them is its ability to minimize the chances of error within the model. Unlike multiple regression, which is unable to do it, this study used structural model for testing the proposed hypothesis of the study.

By examining the fit indices, it was visible that there is good fit between the model and the data. The fit indices such as RMSEA (.045), TLI (.938), and CFI (.923) are within the recommended level. Analyzing the standardized regression and its weights shows that IL is positively associated with teacher's critical thinking ($\beta = 0.525$; $p = 0.000$), thus lending support to H1 as shown in table 03.

Table 03: Structural Regression Weights

	Teachers' Critical thinking		
	β	P	R²
Independent to dependent variable			
H1 : Brand Equity to intention to write a review	0.525	0.000	0.41

The bootstrapping method was used to estimate the mediating effect of knowledge management between IL and teacher's critical thinking. The structural model show indirect effects of knowledge management is significant ($\beta = 0.086$; $p = 0.001$) and is partially mediating the

relationship between IL and teacher's critical thinking because direct effect of IL is also significant with teacher's critical thinking. Thereby confirming H2. The results are shown in the following table 04.

Table 04: Mediation Results

	Teacher's Critical thinking		
	β	SE	P
Total effect of Instructional Leadership	0.611	0.006	0.001
Direct Effect of Instructional Leadership	0.525	0.064	0.004
Indirect Effect via Knowledge Management	0.086	0.030	0.001

Mediator: Knowledge Management

DISCUSSION

The studies have described role of IL and teacher's critical thinking. The current study makes its contribution through empirically examining the impact of IL on teacher's critical thinking by testing the mediating effect of knowledge management love. The results of the study visibly shows IL has impact on teacher's critical thinking. This study contributes to the literature that for enhancing the critical thinking of the teachers, there must be effective IL. Schools that have high IL are developing high

critical thinking in the school teachers and students. Our results are also in line with previous findings that found the relationships of IL and critical thinking strategies (Barfield, 1989; Kim & Lee, 2020; Msila, 2013). Furthermore, our study adds to the literature by incorporating knowledge management as strategy, to explore the underlying mechanism of IL and teacher's critical thinking. The results describe that knowledge management mediates the relationships between IL and teacher's critical thinking. These results are consistent with the previous research (Lam, Nguyen, Le, & Tran, 2021; Zaim, Muhammed, & Tarim, 2019).

Theoretical and managerial implications

There are many contribution of this study. One is its contribution in literature, it provides the evidence that teachers' critical thinking is positively triggered by the IL. In past literature, there is very few work that is on the critical thinking, and using these leadership styles, encouraging teachers to enhance the critical thinking. Furthermore, second contribution of this study is its contribution to the literature on knowledge management. Specifically on the role of knowledge management as a mediator. In this study it plays role of mediator between IL and critical thinking. This study ensures that there is much evidence that teachers may enhance the critical thinking directly by critical thinking and indirectly by knowledge management. Therefore, this study emphasizes on the teachers' critical thinking in teaching and the influence of IL in promoting and developing critical thinking in teachers'. The conceptual framework of this research links the IL of principals to teachers' critical thinking in teaching and knowledge management as mediators.

The policymakers will get the results and information from this research. on IL, teachers' critical thinking, in encouraging teachers to use teaching strategies that promote critical thinking among students.

Additionally, the findings of this study will serve as a roadmap for instructional leaders. By following these recommendations, instructional leaders can foster spirituality in the workplace and engage instructors in teaching methods that foster critical thinking. Finally, the findings of the current study will assist Pakistani policymakers, instructional leaders, instructors, and academics in developing a theory that will result in the addition of new knowledge to the field.

Limitations of the Study

This study is limited to the high school teachers of one of the districts of Sindh province in Pakistan; therefore, the results may not represent all the Pakistani high/secondary school teachers in other provinces in Pakistan. Another limitation is that the present study would include only public secondary schools. Therefore, the results may not be generalized to those teachers who are part of private secondary schools. Another limitation is that the present study measures the influence of IL and workplace spirituality on teachers' critical thinking in teaching through a questionnaire with predefined factors in it. However, some other factors might influence IL and on teachers' critical thinking in teaching. Therefore, relying on only one quantitative method is the limitation of the present study. Finally, the present study only includes the teachers and teachers with perspectives on IL. However, to what extent IL and affect students' performance would not be measured in the present study.

References

1. Abbas, J., & Sağsan, M. (2019). Impact of knowledge management practices on green innovation and corporate sustainable development: A structural analysis. *Journal of cleaner production*, 229, 611-620.
2. Adams, D., Thien, L. M., Chuin, E. C. Y., & Semaadderi, P. (2021). The elusive Malayan tiger 'captured': A systematic review of research on educational leadership and management in Malaysia. *Educational Management Administration & Leadership*, 1741143221998697.
3. Ahmad, N., & Hamid, M. T. S. (2020). Teachers' perceptions regarding the effect of instructional leadership practices of primary school head-teachers on teacher effectiveness. *Journal of Research*, 14(2), 231-248.

4. Ardiansyah, K., Kurniati, D., Trapsilasiwi, D., & Osman, S. (2022). Truth-Seekers Students' Critical Thinking Process in Solving Mathematics Problems with Contradiction Information. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 13(1), 1-13.
5. Arun, K., & Kahraman Gedik, N. (2022). Impact of Asian cultural values upon leadership roles and styles. *International Review of Administrative Sciences*, 88(2), 428-448.
6. Barfield, K. D. (1989). A study of the relationship between active participation in interscholastic debating and the development of critical thinking skills with implications for school administrators and instructional leaders: The University of Alabama.
7. Bhengu, T. T., & Blose, S. (2022). Developing a Collaborative Teacher Learning Culture: Perspectives of Three Secondary School Principals in the Pinetown District. *Journal of Educational Studies*, 21(1), 51-68.
8. BONNEY, C. N. R., & STERNBERG, R. R. J. (2016). Learning to think critically *Handbook of research on learning and instruction* (pp. 191-222): Routledge.
9. Carrington, S., Spina, N., Kimber, M., Spooner-Lane, R., & Williams, K. E. (2022). Leadership attributes that support school improvement: a realist approach. *School Leadership & Management*, 1-19.
10. Carton, A. M. (2022). The Science of Leadership: A Theoretical Model and Research Agenda. *Annual Review of Organizational Psychology and Organizational Behavior*, 9, 61-93.
11. Cooper, D. R., Schindler, P. S., & Sun, J. (2006). *Business research methods* (Vol. 9): Mcgraw-hill New York.
12. Creswell, J. W. (1999). *Mixed-method research: Introduction and application Handbook of educational policy* (pp. 455-472): Elsevier.
13. Creswell, J. W. (2011). Controversies in mixed methods research. *The Sage handbook of qualitative research*, 4(1), 269-284.
14. Day, D. V., & Antonakis, J. (2013). The future of leadership. *The Wiley-Blackwell handbook of the psychology of leadership, change, and organizational development*, 221-235.
15. Epler, P., & Jacobs, J. (2022). *Guide to Integrating Problem-Based Learning Programs in Higher Education Classrooms: Design, Implementation, and Evaluation: Design, Implementation, and Evaluation*: IGI Global.
16. Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods*, 39(2), 175-191.
17. Filatotchev, I., Wei, L. Q., Sarala, R. M., Dick, P., & Prescott, J. E. (2020). Connecting eastern and western perspectives on management: Translation of practices across organizations, institution and geographies. *Journal of Management Studies*, 57(1), 1-24.
18. Garzón, E., & Castañeda-Peña, H. (2015). Applying the Reader-Response Theory to Literary Texts in EFL-Pre-Service Teachers' Initial Education. *English Language Teaching*, 8(8), 187-198.
19. Hackmann, D. G., Malin, J. R., & Gilley, D. (2018). Career academies: Effective structures to promote college and career readiness. *The Clearing House: A*

- Journal of Educational Strategies, Issues and Ideas, 91(4-5), 180-185.
20. Haidar, S., & Fang, F. (2019). English language in education and globalization: A comparative analysis of the role of English in Pakistan and China. *Asia Pacific Journal of Education*, 39(2), 165-176.
 21. Hair, J. F. (2009). *Multivariate data analysis*.
 22. Hallinger, P. (2011). Leadership for learning: Lessons from 40 years of empirical research. *Journal of educational administration*.
 23. Hallinger, P. (2015). The evolution of instructional leadership Assessing instructional leadership with the principal instructional management rating scale (pp. 1-23): Springer.
 24. Hallinger, P., Gümüş, S., & Bellibaş, M. Ş. (2020). 'Are principals instructional leaders yet?' A science map of the knowledge base on instructional leadership, 1940–2018. *Scientometrics*, 122(3), 1629-1650.
 25. Hallinger, P., Murphy, J., & Hausman, C. (1992). Restructuring schools: Principals' perceptions of fundamental educational reform. *Educational Administration Quarterly*, 28(3), 330-349.
 26. Hallinger, P., Wang, W.-C., & Chen, C.-W. (2013). Assessing the measurement properties of the principal instructional management rating scale: A meta-analysis of reliability studies. *Educational Administration Quarterly*, 49(2), 272-309.
 27. Hidayat, M., Kurniawan, D. A., Yolviansyah, F., Sandra, R. O., & Iqbal, M. (2022). How Critical Thinking Skills Influence Misconception in Electric Field. *International Journal of Educational Methodology*, 8(2), 377-390.
 28. Hoodbhoy, P. (2009). Pakistan's higher education system—What went wrong and how to fix it. *The Pakistan Development Review*, 48(4), 581-594.
 29. Indrašienė, V., Jegelevičienė, V., Merfeldaitė, O., Penkauskienė, D., Pivorienė, J., Railienė, A., . . . Valavičienė, N. (2021). Linking critical thinking and knowledge management: A conceptual analysis. *Sustainability*, 13(3), 1476.
 30. Innabi, H., & Sheikh, O. E. (2007). The change in mathematics teachers' perceptions of critical thinking after 15 years of educational reform in Jordan. *Educational Studies in Mathematics*, 64(1), 45-68.
 31. Kang, H. (2021). Sample size determination and power analysis using the G* Power software. *Journal of educational evaluation for health professions*, 18.
 32. Kim, T., & Lee, Y. (2020). Principal instructional leadership for teacher participation in professional development: evidence from Japan, Singapore, and South Korea. *Asia Pacific Education Review*, 21(2), 261-278.
 33. Lam, L., Nguyen, P., Le, N., & Tran, K. (2021). The relation among organizational culture, knowledge management, and innovation capability: Its implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 66.
 34. Liu, S., & Hallinger, P. (2018). Principal instructional leadership, teacher self-efficacy, and teacher professional learning in China: Testing a mediated-effects model. *Educational Administration Quarterly*, 54(4), 501-528.

35. MacQueeney, P., Lewis, E., Fulton, G., Surber, C., Newland, K., Hochstetler, E., & Tilak, S. (2022). Applying Piaget to classroom teaching: Stage development and social learning theory. Theories, strategies and semiotic tools for the classroom: The.
36. Manan, S. A., & Hajar, A. (2022). "Disinvestment" in Learners' Multilingual Identities: English Learning, Imagined Identities, and Neoliberal Subjecthood in Pakistan. *Journal of Language, Identity & Education*, 1-16.
37. Mao, W., Cui, Y., Chiu, M. M., & Lei, H. (2022). Effects of game-based learning on students' critical thinking: A meta-analysis. *Journal of Educational Computing Research*, 59(8), 1682-1708.
38. Mayer, M., & Zack, M. (1996). The design and implementation of information products. *Sloan Management Review*, 37(3), 45-59.
39. McGloughlin, D. M. (2016). How district leaders use knowledge management to influence principals' instructional leadership. Grand Canyon University.
40. Msila, V. (2013). Instructional leadership: Empowering teachers through critical reflection and journal writing. *Journal of Social Sciences*, 35(2), 81-88.
41. Muhammadiyeva, H., Mahkamova, D., Valiyeva, S., & Tojiboyev, I. (2020). The role of critical thinking in developing speaking skills. *International Journal on Integrated Education*, 3(1), 62-64.
42. Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*: Routledge.
43. Piaget, J. (1976). Piaget's theory Piaget and his school (pp. 11-23): Springer.
44. Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 88(5), 879.
45. Rombout, F., Schuitema, J., & Volman, M. (2022). Teaching strategies for value-loaded critical thinking in philosophy classroom dialogues. *Thinking Skills and Creativity*, 43, 100991.
46. Rudolph, C. W., Katz, I. M., Ruppel, R., & Zacher, H. (2021). A systematic and critical review of research on respect in leadership. *The Leadership Quarterly*, 32(1), 101492.
47. Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*: John Wiley & Sons.
48. Shahzad, M., Qu, Y., Zafar, A. U., & Appolloni, A. (2021). Does the interaction between the knowledge management process and sustainable development practices boost corporate green innovation? *Business Strategy and the Environment*, 30(8), 4206-4222.
49. Sio, J., & Ismail, R. (2019). Binary logistic regression analysis of instructional leadership factors affecting English language literacy in primary schools. *3L, Language, Linguistics, Literature*, 25(2).
50. Vroom, V. H., & Jago, A. G. (2007). The role of the situation in leadership. *American psychologist*, 62(1), 17.
51. Warsi, J. (2004). Conditions under which English is taught in Pakistan: An applied linguistic perspective. *Sarid Journal*, 1(1), 1-9.
52. Winarso, W., & Haqq, A. A. (2020). Where Exactly for Enhance Critical and Creative Thinking: The Use of Problem Posing or Contextual Learning. *European Journal of Educational Research*, 9(2), 877-887.

53. Woodard, T., & McDonald, C. (2021). Career Preparedness: Perspectives from C&CJ Alumni at an SCU. *Teacher-Scholar: The Journal of the State Comprehensive University*, 10(1), 3.
54. Yeh, Y.-c. (2012). A co-creation blended KM model for cultivating critical-thinking skills. *Computers & Education*, 59(4), 1317-1327.
55. Yusof, M. R. B., Ibrahim, M. Y. B., & Rahim, S. B. A. (2017). The relationship between virtual instructional leadership and teaching competency. *International Journal of Academic Research in Business and Social Sciences*, 7(8), 146-156.
56. Zaim, H., Muhammed, S., & Tarim, M. (2019). Relationship between knowledge management processes and performance: critical role of knowledge utilization in organizations. *Knowledge Management Research & Practice*, 17(1), 24-38.
57. ŽivkoviL, S. (2016). A model of critical thinking as an important attribute for success in the 21st century. *Procedia-social and behavioral sciences*, 232, 102-108.