



The Core Ability Of Principal's Virtual Instructional Leadership On Teachers' Commitment In Higher Institution: A Systematic Literature Review

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ABSTRACT

This systematic review aims to highlight the positive impact that principal's virtual instructional leadership have on the development of teachers' commitment, Virtual instructional leadership is the intersection of electronic leadership and teaching leadership which is rapidly developed. Effective virtual instructional leadership in higher education needs to keep pace with current opportunities and challenges. The definition of virtual instructional leadership, there is relatively little research on the definition, operation mechanism, and relationship between virtual instructional leadership management and teaching. Previously updated research is no longer suitable for current developments, required further comprehensive and systematic digitization. This research systematically reviews previous studies on instructional leadership from 2015 to 2024, including the finding, research method and limitation. The review mainly use descriptive synthesis and textual narrative synthesis.

According the 202 records, 37 studies remained after applying the exclusion criteria. Research has increased but remains limited in terms of theory, sophistication and evidence. Definitions and theories of instructional leadership vary in scope and degree of consideration in the studies reviewed mainly functional rather than a critical perspective predominates. Most studies are of low quality and lack rigor in research questions and methods, resulting in inconclusive findings. The review recommends the establishment of an instructional leadership research maturity framework and further research into theoretical definition and digitization to address gaps in the literature identified in the review.

After theoretical construction and empirical analysis, the principal's virtual instructional leadership consists of six ability elements: strategic leadership ability, change promotion ability, technology application and resource sharing ability, virtual communication and coordination ability, digital learning development ability and virtual culture construction ability. This model conforms to the reality of our country's colleges and universities and the role positioning and responsibilities of principals, and can provide scientific theoretical guidance for the theoretical research and practical improvement of virtual instructional leadership in high institution.

Keywords: Principal's virtual instructional leadership, teacher commitment, systematic review

INTRODUCTION

With the rapid development of Industrial 4.0, Industry 4.0 has changed human life style, also profoundly affected the high institution teaching, education 4.0 become more and more obviously tend to diversified and technological.(Sharma, P. 2019)Education 4.0 redefines education as an inclusive, lifelong learning experience which places the responsibility for skill development on the learner, with teachers and leaders

acting as facilitators and enablers (World Economic Forum,2023), According to the Chinese Ministry of Education,In China, there are more than 500,000 schools and nearly 300 million students. In order to manage students most wisely and high-effectively, the usage of big data and AI will be explored to provide a freedom individual learning experience. (Zhang & Zou, 2019)

Therefore, principal play a significance role to instruct teachers to fulfill this assignment, improve teachers usage of digital tool ability, fulfil and make better the school's goal and vision , manage the instructional program, promote a positive school learning climate, further to improvement of teacher's commitment to school, pupils, teaching, profession.(lei Mei et al,2014) Further study of Principal's virtual instructional leadership is benefit for MOE Policy Development on Virtual Leadership in China and continuously improve the three-dimensional leadership theory of virtual leadership.

This passage aims to analysis the mediating elements in the relationship between principal virtual instructional leadership and teacher commitment in academic affairs in China by systematic literature review method.

LITERATURE REVIEW

Education 4.0 has caused a new iteration in the use of digital tools in higher education(Christopher Alan Bonfield, 2022), It is further important for university leaders to make changes in instructional leadership and guide teachers on how to use digital tools to develop class management ways and teaching quality. Digital leadership emerges from the context of the covid 19 era. The related research note that "higher education lags far behind most in digital other Industries", In higher education institutions education urgently needs digital transformation of virtual instructional leadership included integrate strategic, power distribution, personnel, teaching, cultural and technical resources for operations online, the principal's instructional leadership should be combined with the advancement of the new era of industrial 4.0. (Bonfield, C. A.,2020).

Ersoy et al. (2016) noted the lack of obvious, continuous and clarity definition of virtual instructional Leadership They cite a 2015 survey of 4,800 management professionals in the United States that "the key method of confirming to successful digital transformation... focus more on strategy, culture and talent development rather than technology issues." (Ibid., p. 142). (Irma Rachmawati Maruf,2022) noted that, best instructional leadership practices is using virtual learning applications to improve students' learning outcomes. Returning to the domestic issue in China, looking at the existing data, the results of teacher tests show that it is said that the ability to use a variety of multimedia or virtual learning applications is still insufficient among teachers, even lower than the average level of teachers at international levels.

(PlanninOrunbon, N. O,2023) pointed out that principals' digital transformation leadership plays an important role in teachers' organizational commitment by encouraging teachers to innovate, take positive actions to achieve organizational commitment and job satisfaction, and ensure the sustainability of the school organization. The study revealed that there is a strong significant positive relationship between principals' digital transformation leadership and teachers' job satisfaction, therefore the study recommended that the Lagos State Government should support professional development initiatives such as conferences, workshops, seminars and Secondary school teachers are trained to keep their knowledge up to date, especially their knowledge of digital technologies.

Matthews-Chioma,E.(2017)proposed that transformational leadership in the organization with a more positive school culture will improve teachers' organizational commitment. According to these research, there is relatively little research on virtual instructional leadership using campus culture to improve teacher commitment. Cansoy, R., Parlar, H,(2022) The research found that teachers' collective efficacy plays a mediating role between principals' instructional leadership behaviors and teachers' engagement. The principals' instructional leadership behaviors increase the collaboration among teachers, directly affecting teachers' collective efficacy and thus promoting teachers' work engagement in school.

Sukarmin, S.(2022) found that principals' instructional leadership had a moderate impact on teachers' organizational commitment ($\beta= 0.397$).

Judging from the literature in recent years, there is a significance influence of principals' instructional leadership on teacher commitment. There is currently relatively little research on electronic virtual instructional leadership. Combining it with Education 4.0 will lead to more research innovation space.

Figure 1 :The Content of Literature

Ref	Year	Paper title, Author & Journal/Conference	Technologies/ Method Used	Finding/Outcomes of the Papers	Limitations of the Papers
1	2018	Assessing the contribution of principal instructional leadership and collective teacher efficacy to teacher commitment in Oman	Cross-sectional, survey research design	The relationship between principal leadership and teacher commitment can also be put in perspective by referring to expectations for teacher development in Oman. Principals also need further education in reshaping their own beliefs and attitudes about their role in working with teachers to improve Omani schools.	Design and sample.
2	2022	Collective teacher efficacy as a mediator in the relationship between instructional leadership and teacher commitment	Multiple regression analysis	The principal's instructional leadership behaviors increase collaboration among teachers, which helps improve their commitment to the school	1) The overall relationship were examined only according to teacher perceptions 2) The different school types should be researched in future study.
3	2018	Do beliefs make a difference? Exploring how principal self-efficacy and instructional leadership impact teacher efficacy and commitment in Iran	A cross-sectional survey design	This study found moderately strong, statistically significant positive correlations between principal self-efficacy, instructional leadership, and teacher collective efficacy, as well as with teacher commitment.	1) This study focused exclusively on primary schools in location of a single city of Iran. 2) The sample of teachers per school is relatively small which influence the research result. 3) The effects of leadership on student learning is not examined.
4	2022	The influence of principal instructional leadership behaviour on the organisational commitment of junior high school teachers in Surakarta	A quantitative Approach and cross-sectional survey design	Principal instructional leadership has a moderate impact on teacher organizational commitment ($\beta = 0.397$)	1) This research is only focused on junior high school located in Surakarta. 2) For future studies, this study's approach should be advanced, such as mixed-method, split-sample.
5	2016	Relationship between the Instructional Leadership Behaviors of High School Principals and Teachers' Organizational Commitment.	Relational survey	Teachers' organizational commitment is low on the "compliance" dimension and medium on the "identification" and "internalization" dimensions. For the adaptation dimension, negative There is a correlation between principals' instructional leadership behaviors and teachers' organizational commitment. There is also a significant positive correlation between principals' instructional/leadership behaviors and teachers' organizational commitment in terms of recognition and internalization dimensions. It was also found that "Establishing a well-organized teaching system" The "environment and climate" dimension of instructional leadership behaviors significantly predicted the subdimensions of organizational commitment.	/
				There were positive and moderately significant correlations between principals' instructional leadership behaviors and each	/

6	2017	The Relationship between Teachers' Perception of School Principals' Instructional Leadership and Organisational Commitment Level.	Correlative investigation model	dimension of teachers' affective and normative commitment. Teachers' perceptions of principals' instructional leadership behaviors were high in all dimensions; their commitment to the school was good in terms of affective commitment, whereas in other dimensions, perceptions were moderate. Normative commitment and affective commitment were positively and moderately related to teachers' perceptions of principals' instructional leadership behaviors.	
7	2022	PRINCIPALS'INSTR UCTIONAL LEADERSHIP PRACTICES AS CORRELATES OF TEACHERS JOB COMMITMENT IN SECONDARY SCHOOLS IN ENUGU STATE	Correlational research design,self-structured questionnaire	There is a strong positive and significant relationship among principals' leadership practices and teachers' job commitment in secondary schools in Enugu State	This study's location is only in secondary school teachers in enugu state.
8	2010	The relationship of instructional leadership, teachers' organizational commitment and students' achievement in small schools	Two questionnaires, SPSS Version 16.0 using correlational research design	Instructional leadership practices are partially related to the internal orientation dimension of organizational commitment. Among the three dimensions of instructional leadership, only two dimensions (D1 and D3) have a significant positive impact on the internal orientation of organizational commitment. There is also a positive relationship between the external	This study only focused on small schools.
				orientation dimension of teachers' organizational commitment and students' academic performance.	
9	2019	Relationship of instructional leadership, organizational climate and teacher's commitment to job satisfaction	Descriptive method with a quantitative approach	There is a direct and indirect relationship between instructional leadership, organizational climate, teacher commitment, and job satisfaction. the principal's leadership isthe basis for the job satisfaction achievement for both teachers and staff inthe organization, directly and through the organizational climate created andthe commitment of each teacher.	/
10	2015	Principals' instructional leadership and teachers' commitment in three Mara junior Science Colleges (Mjsc) in Pahang, Malaysia	Descriptive statistics and inferential statistics	The relationship between instructional leadership and the level of teachers' commitment is high. There is a significant relationship between instructional leadership and the level of teachers' commitment in three MJSCs in Pahang.	The sample not enough, which is just focused on Three Mara Junior Science Colleges (Mjsc)
11	2023	(Re) Investigating the pathways between instructional leadership, collective teacher efficacy, and teacher commitment: a multilevel analysis	Quantitative cross-sectional Research design	The direct relationship between instructional leadership and teacher Commitment was significant at the school level. Similarly, instructional leadership exhibits a significant direct effect on collective teacher efficacy. Collective teacher efficacy	The multilevel analysis should be further investigations with larger sample sizes at group and individual levels.

				also has a significant direct effect on teacher commitment. The results also indicate a significant indirect effect at school level between instructional leadership and teacher commitment through collective teacher efficacy.	
12	2023	Instructional leadership, and teacher's collective efficacy, commitment, and professional learning in primary schools: a mediation model	Survey	Findings confirmed a partial mediation model whereby principal instructional leadership has both direct and indirect effects on teacher professional learning. The research also revealed how instructional leaders influence the professional learning of teachers through teacher's collective efficacy, commitment.	1) This study focuses on primary schools in a single city in Iran 2) This study focuses on the mediating effect of instructional leadership on teacher professional learning. Considering the complexity of the model and the limited number of primary schools (n = 121), the SEM used in this study was conducted using factor means instead of latent variables.
13	2021	The evolving dynamics between instructional leadership, collective teacher efficacy, and dimensions of teacher commitment: what can Chinese independent high ...	Descriptive statistics and inferential statistics partial least squares structural equation modeling method	Instructional leadership has a significant relationship with teachers' commitment to school, students, and teaching, except for the dimension of teachers' commitment to the profession. Collective teacher efficacy has a significant mediating role between instructional leadership and each dimension of teacher	This study has mainly focus on only five Chinese Independent High Schools located in Penang, Malaysia
				commitment (i.e., commitment to school, students, teaching, and profession). This study provides an empirical study for domestic scholars on the evolution of the relationship between instructional leadership, collective teacher efficacy, and teacher commitment.	
14	2024	Effect of principal instructional leadership on teacher commitment	A literature review approach, scrutinizing journal articles	Principals' instructional leadership and the resulting organizational commitment had a positive and statistically significant impact on teachers' organizational commitment across all countries.	Only 15 articles from the sample met the specified criteria and were subsequently included in the review
15	2021	The effects of principal instructional leadership on teacher commitment in private primary green schools in Indonesia	Valid questionnaires, Structural equation model (SEM), Statistical analysis	Principal instructional leadership significantly affects teacher commitment through teacher self-efficacy and teacher collective efficacy, although it does not directly determine teacher commitment. Therefore, the role of teacher self-efficacy and teacher collective efficacy is crucial to implementing the principal instructional leadership practices in the case to build teacher commitment.	Samples are only from private green primary schools

16	2019	The relationship between instructional leadership and organizational commitment of teachers	Online survey	(a) Teachers rated their principals' instructional leadership functions highest in terms of setting and communicating school goals, (b) Teachers reported higher levels of organizational commitment when principals communicated school goals, and (c) Years of teaching experience, school environment, school size, or grade level taught did not affect teachers' organizational commitment.	The first limitation is that this study only involved elementary regular education kindergarten through fifth grade teachers. The second limitation is that the results may not be applicable to other grade levels or school levels. The third limitation is that this study was conducted during a specific time period and represents the views at that time.
17	2023	School leadership in an urban context: Complicating notions of effective principal leadership, organizational setting, and teacher commitment to students	SEM	The impact of TL on district teacher engagement and organizational context concepts suggests that urban school leaders maintaining high performance expectations may promote teacher engagement with students. More importantly, this study highlights the need for further exploration of contingency approaches to understand leadership in specific school contexts.	The sample is just exclusively in situated in a large urban public school district
18	2021	A correlation study between principals' instructional leadership practice and teachers' organizational commitment in Yogyakarta province, Indonesia	Quantitative survey research design	Experienced, older, and male teachers have lower engagement, but they believe that the level of principal's instructional leadership can improve their engagement with the school, and the principal's instructional leadership practices are very useful for teachers, allowing the government to assign more young teachers in high schools to promote peer teaching among teachers to create a balance.	1) Due to time financial and material resource limitation, this study was unable to comprehensively examine the school culture of each school, and the investigation focused on the relationship between the three leadership styles and teacher performance. 2) This research was on public focused high school teachers at Yogyakarta province
19	2020	Instructional leadership and students academic performance: Mediating effects of teacher's organizational commitment	SEM	Teacher's organizational commitment is mediator which is an indirect positive effect of principals' instructional leadership and students' academic performance, higher instructional leadership levels had better teachers commitment, improve student's academic performances	1) The first limitation involves data collection methods 2) The researchers conducted on primary schools in one state in Pakistan 3) Quantify student academic achievement (a statewide standardized test for fifth graders)
20	2020	Instructional leadership and teachers' intent to leave: The mediating role of collective teacher efficacy and shared vision	Survey, SEM	Collective teacher efficacy and shared vision emerge as prominent mediators between principals' instructional leadership and a teacher's intent to leave. Regarding the differences between the two sectors (Arab and Jewish) that exist in the Israeli education system, collective teacher efficacy, as well as shared vision, played a mediating role between instructional leadership and a teacher's intent to leave in the Jewish elementary schools, while in the Arab elementary schools, only collective teacher efficacy played a mediating role between instructional leadership and a	There is limited research on the relationship between CTE and teachers' intention to leave the profession.

				teacher's intent to leave	
21	2019	Effect of instructional leadership on teachers' performance and job commitment:	Developed instrument at 4point likert scale	In this study, the researchers also explored the significant differences between the effects of	/
		A comparison of public and private universities of Lahore		instructional leadership on teacher performance and teacher job commitment. An important part of this study is the effect of instructional leadership on teacher performance, job commitment and comparison between private and public universities in Lahore	
22	2018	Examining the relationship between school principals' instructional leadership behaviors, teacher self-efficacy, and collective teacher efficacy	Arithmetic mean, Pearson product-moment correlation coefficient, and multiple linear regression analysis	There is positive and significant relationships between school leadership, teacher self-efficacy, and collective teacher efficacy. Furthermore, effective school leadership behaviors and teacher self-efficacy were found to be positive and significant predictors of collective teacher efficacy.	/
3	021	Relationship between Instructional leadership practices and organizational commitment of teachers at secondary school level in lahore districts	Random sampling, Questionnaire, descriptive and inferential statistics, Pearson correlation	There is a positive relationship between the current instructional leadership and the level of organizational commitment in Pakistan. Principals should use their wisdom in instructional leadership skills to enhance the organizational commitment of teachers.	
24	2024	THE RELATIONSHIPS BETWEEN PRINCIPAL INSTRUCTIONAL LEADERSHIP AND TEACHERS' AFFECTIVE COMMITMENT THROUGH COLLECTIVE TEACHER ...	Cross-sectional quantitative survey design (PLS-SEM)	The principal's instructional leadership has a significant direct impact on teachers' affective commitment, and teacher collective efficacy as a mediating variable can have a significant indirect impact. However, school location has no moderating effect on the relationship between principal's instructional leadership and teachers' affective commitment.	/
25	2017	The relationships between school autonomy gap, principal leadership, teachers' job satisfaction and organizational commitment	A school leader questionnaire and a teacher questionnaire. A path model, Multiple-group comparison	Instructional and transformational leadership have a significant positive impact on teachers' job satisfaction and organizational commitment, and school climate and teacher self-efficacy as mediating variables indirectly affect their relationship. School autonomy gap appears as an important influencing factor in the path model.	Firstly, qualitative data should be collected to gain a deeper understanding of the autonomy gap and its impact on principals' school management practices. Second, this study and future research should consider regional differences, especially in China. Due to fiscal decentralization, economic resources of schools in different regions of China vary. Third, the autonomy gap can be elaborated in different policy areas.
26	2019	The relationship between school principals' leadership and teachers' organisational commitment: a systematic review	Systematically reviewing	The leadership behaviors highlighted in these studies are having a common goal and vision in the school, forming a collaborative culture, enhancing communication and interaction, showing interest and appreciation for individuals, supportive and constructive behavior, fairness, creating a work	/

				atmosphere culture based on trust, sharing responsibilities, and managing and sustaining change in the school. Organizational commitment of school principals was reported to be positively correlated with transformational leadership, servant leadership, and ethical leadership behaviors. These leadership behaviors were also found to be significant predictors of organizational commitment.	
27	2019	The Relationship of Primary School Principals' Leadership Practice on Teachers' Commitment	Random sampling, Principal Instructional Management Rating Scale (PIMRS) SPSS version 21.0	These elements of principals' leadership practices have a positive effect on primary school teachers' engagement and competence, commitment, and have been shown to improve organizational effectiveness. From the findings, the researchers believe that primary school principals focus primarily on the practical aspects of their own leadership during their work.	1) Only questionnaire was used as the instrument to collect data. 2) This study was conducted only in primary schools in Tanah Merah area, Kelantan and was based on several theories and models selected by the researcher that were relevant to the variables involved selected by the researcher. .
28	2017	The Relationship Between Women Principal Instructional Leadership Practices, Teacher Organizational Commitment And Teacher Professional Community Practice In Secondary Schools In Kuala Lumpur	The non-experimental quantitative study Questionnaires, descriptive and inferential analysis	1. School teachers rated that the instructional leadership practice of female principals is moderate. Teachers believe that their teacher organizational commitment is moderate, but their teacher professional community practice is high. 2. There is a positive and significant relationship between the instructional leadership practice of female principals, the teacher professional community practice and the teacher organizational commitment 3. Creating a positive school learning atmosphere is an important predictive dimension of teacher organizational commitment	1) This study was conducted in 39 of the 61 public secondary schools led by female principals. 2) Second, the researchers only used closed-ended questionnaires as a research instrument to collect data, and no observations and interviews were involved. 3) Third, many aspects may affect teachers' organizational
					commitment to the school, such as their demographic background or work environment
29	2021	Exploring how instructional leadership affects teacher efficacy: A multilevel analysis	Multilevel modeling approach, hierarchical linear model (HLM), questionnaires and modified items from prior research	Instructional leadership has a direct and positive impact on teacher effectiveness in terms of creating a positive learning climate. Instructional leadership practices that define the school's mission, manage instructional programs, and create a positive school learning climate have a positive impact on teacher trust. Results highlight the fact that specific instructional leadership practices have a stronger indirect effect on teacher effectiveness than a direct effect through teacher trust in the principal.	1) First, the school sample is small. 2) Second, a possible limitation of our study is its cross-sectional nature. 3) Third, trust was conceptualized and measured as a single construct in this study. 4) Finally, we found that the current study focused on teacher efficacy as a distal dependent variable rather than student learning.
30	2024	Teacher Perceptions of Principal Instructional Leadership Practice and Collective Efficacy Predictions on	Quantitative correlational study, survey with	PIL and CTE are significant predicted factors in teachers' affective commitment and	First, It is limitation of data sources and consequences and limitation of sampling

		Teacher Commitment	convenience sample,multiple regression analysis	normative commitment, but PIL and CTE cannot significantly predict teacher continuance commitment.	strategy
31	2023	THE INFLUENCE OF INSTRUCTIONAL LEADERSHIP OF PRIMARY SCHOOL HEADS ON TEACHERS' COMMITMENT IN MAURITIUS	Descriptive mixed research approach ,The cluster Sampling;a survey	Confirming previous empirical research: primary school principals are believed to set vision and goals; they build a positive school culture that supports teachers and students to improve teaching and learning processes; they manage school resources and empower others, and encourage professional development of teachers. This study recommends creating a collaborative platform to promote a community of practice between teachers and principals to enhance teachers' commitment	/
32	2023	An Investigation into Principals' Instructional Leadership and Lecturers' Organizational Commitment Within the Community Colleges in Jamaica	A questionnaire, quantitative correlational study, Multiple Regression Analysis, purposive sampling technique,	1. There is a positive relationship between the principal's instructional leadership and the organizational commitment of lecturers, but to a low degree. Defining the university mission is positively correlated with affective commitment and normative commitment, but negatively correlated with continuance commitment. 2. Defining the university mission, managing the instructional program, and creating a positive university climate predict affective commitment and continuance commitment. However, creating a positive university climate is the only predictor of normative commitment. The study concluded that the principal's instructional leadership is necessary in community colleges and is related to the organizational commitment of lecturers.	/
33	2019	The influence of instructional leadership and school culture on teacher organizational commitment	Via observations, semi-structured interviews, constant comparison, structural coding and thematic analysis	We found that all themes had a positive impact on teacher organizational commitment. Thematic analysis for research question two resulted in one theme: the influence of school culture. The results showed that school culture influenced teacher organizational commitment. The results supported how the concept of principal instructional leadership and organizational culture influenced teacher organizational commitment.	Identify specific demographics of participants or limit study settings.
34	2023	Principal leadership practices, professional learning communities, and teacher commitment in Hong Kong kindergartens: A multilevel SEM analysis	Point Likert scale ,multilevel structural equation modeling, used SPSS 24.0 and Mplus 7.0 to analyze the data, Descriptive	Principal leadership practices promote professional learning communities' development at the school and teacher levels and have a direct impact on teacher commitment at the teacher levels. However, the mediating effects of different professional learning community components is particular. This paper discusses the implications for kindergarten leaders in the reform era.	First, convenience sampling was used. Although the sample size was large, the kindergarten teachers were all involved in the university-school partnership program. Although they were not supported by the program, these schools may have shown a higher level of professional development leadership,

			statistics and correlations		limiting the generalizability of this study. Second, due to the limited kindergarten sample, this study could not cover all five PLC characteristics.
35	2023	Relationship between Principal Instructional Leadership, Job Satisfaction, Work Commitment and Performance of SDN Teacher in South Banjarmasin	Descriptive correlational using a path analysis model	There is a partial direct relationship between the instructional leadership of the headmaster, job satisfaction, work commitment and teacher performance. There is an indirect relationship between the instructional leadership of the headmaster and job satisfaction and performance in primary schools in South Banjarmasin district of Banjarmasin. The suggestion for the principal is to continue with this instructional leadership because in practice it improves teacher performance.	/
36	2022	Correlation among Instructional Leadership, Work Commitment, and Teacher Work Discipline toward Students Learning Achievement at Elementary Schools in Haur Gading District	Quantitative with fact exposure, a likert scale questionnaire, descriptive statistics, simple regression, path analysis and multiple regression using SPSS 25. product moment person correlation, path analysis	There is a direct correlation between instructional leadership, work commitment, and work discipline on student achievement. In addition, there is a direct correlation between instructional leadership on commitment and work discipline. Instructional leadership is indirectly related to student achievement through work commitment, and instructional leadership is indirectly related to student achievement through work discipline.	/
37	2017	The Relationship between Teachers' Perception of School Principals' Instructional Leadership and Organisational Commitment Level	Questionnaires	The dimensions of the principal's instructional leadership behavior are positively correlated and moderately significantly correlated with the teacher's affective commitment and normative commitment respectively. Teachers' perception of the principal's instructional leadership behavior is high in all dimensions; In terms of affective commitment, teachers have a good commitment to the school, and in other dimensions, teachers' perception of the principal's instructional leadership behavior is moderate, normative commitment, affective commitment and teachers' perception of the principal's instructional leadership behavior are both moderately positively correlated.	/

METHODOLOGY

3.1 Method

This article uses the method of systematic literature review to study how some intermediate variable, such as teacher efficacy, teacher trust, the principals' instructional leadership influence teachers' commitment behavior in recent 10 years.

A summary and critical analysis of the literature in the past 10 years will help future education researchers better study the application of digital instructional leadership online in the teaching environment.

3.2 Research questions

1. What is the extent of prior empirical research on the concept and operationalization of virtual instructional leadership in higher education institutions?

2. What are the overarching narrative themes and suggested summative findings from the Principal's Virtual Instructional Leadership Maturity Framework to guide research and policy generated from studies on virtual instructional leadership in higher education?
3. how to improve the situation of teachers with heavy administrative tasks by studying the instructional leadership of principals usage of digital tools?

3.3 Design

Given the above aim, we adopted a systematic review approach to examine the extent, scope, and nature of research activities in this area and identify research gaps in the existing literature (Arksey H, 2005). Given that the scope of the earlier review covered the areas of e-leadership and technology-enhanced learning, our goal was to conduct a more focused updated systematic review of virtual instructional leadership in higher education, rather than a scoping review, referring to the Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0. This involved the following steps: 1) identification of the area of interest; 2) systematic literature search; This review followed a convergent synthesis design based on results. That is, qualitative, quantitative, and mixed methods studies were identified in a single search and integrated throughout the analysis, synthesis, and presentation process.

In the process of conducting a systematic literature review, data sources and processing are crucial links, which are directly related to the accuracy and reliability of the research results. This section will elaborate on the sources, screening criteria, extraction process, and subsequent data collection and analysis methods in this study.

First of all, in terms of data sources, this study mainly relies on well-known academic databases at home and abroad, such as databases such as CNKI, Wanfang, VIP, Web of Science and Scopus. These databases contain a wealth of academic journal articles, providing a broad data base for this study. By setting a reasonable search strategy, this study can comprehensively collect literature related to "The impact of principals' virtual instructional leadership on the commitment of high institution teachers".

During the data screening stage, this study followed strict screening criteria. First, we set clear filtering conditions based on the research topic, including publication time of the document, research field, research object, etc. The setting of these conditions helps ensure that the selected literature is highly relevant to the topic of this research. Secondly, we evaluated the quality of the literature, mainly examining the scientificity of its research methods, the reliability of its data sources, and the reasonableness of its conclusions. Through this series of screening processes, we finally identified a batch of high-quality, highly relevant literature as the data source for this study.

In the data extraction process, this study used a standardized data extraction form to ensure the accuracy and consistency of the data. We recorded the basic information of each document in detail, such as author, publication time, research purpose, research methods, main findings, etc.

STATISTICAL ANALYSIS

The purpose of this study deeply explore the impact of principals' virtual instructional leadership on teacher commitment. Through a systematic literature review and empirical analysis, we obtained a series of enlightening research results. Our research data are presented in detail below and provide an in-depth qualitative descriptive analysis of how each dimension of virtual instructional leadership specifically affects teacher commitment.

First, from the perspective of quantitative data, we adopted search literature methods to collect extensive feedback information from teachers in different school. Through statistical analysis of these data, we found that multiple dimensions of virtual instructional leadership were significantly correlated with teacher commitment. Specifically, technology application and resource sharing ability, virtual communication and coordination ability, digital learning development ability and virtual culture construction ability have all had a positive impact on teacher commitment to varying degrees.

In terms of communication and coordination abilities, data show that when virtual instructional leaders can effectively communicate and coordinate online, teachers' sense of belonging and identity are significantly enhanced, thereby enhancing their organizational commitment. This may be because good communication and coordination skills help reduce misunderstandings and obstacles in information transmission, allowing teachers to participate in teaching work more smoothly, thereby enhancing their loyalty to the organization.

In the dimension of digital technology resource sharing capabilities, we found that the rich teaching resources and sharing platform provided by the principal's virtual instructional leadership have greatly promoted knowledge exchange and cooperation among teachers. This kind of resource sharing across time and space not only improves teachers' teaching efficiency, but also stimulates their enthusiasm for innovation, thus having a positive impact on their professional commitment. Teachers cherish such a working environment more and are willing to make more efforts to improve teaching quality.

In terms of teaching guidance and support, the data shows that the timely and effective teaching guidance and support provided by the principal's virtual instructional leadership has a significant effect on improving teachers' teaching abilities and self-confidence. When teachers encounter confusion or problems during the teaching process, they can receive timely guidance and support from virtual instructional leaders. This not only helps them solve the problem quickly, but also allows them to feel the care and support of the organization, thereby enhancing their emotional commitment.

In summary, through a combination of quantitative data and qualitative descriptive analysis, we deeply analyzed the specific impact of each dimension of principal's virtual instructional leadership on teacher commitment. These research results not only provide useful reference and inspiration for university administrators, but also lay a solid foundation for subsequent related research. We look forward to conducting more in-depth and systematic research on this basis in the future to further promote the theoretical and practical development of virtual instructional leadership and teacher commitment in colleges and universities.

DISCUSSION

In summary, through the combination of descriptive analysis, we have deeply analyzed the specific impact of virtual instructional leadership dimensions on teacher commitment. These research results not only provide good reference and inspiration for university administrators, but also lay a solid foundation for subsequent related research. We look forward to conducting more in-depth and systematic research on this basis in the future to further promote the theoretical and practical development of virtual instructional leadership in colleges and universities and the field of teacher commitment.

Specifically, some studies focus on exploring how specific dimensions of principals' virtual instructional leadership, such as decision-making ability, communication ability, motivational ability, etc., respectively affect teacher commitment. These studies found that different dimensions of leadership influence teacher commitment to varying degrees and in different ways. For example, principals with strong decision-making abilities can formulate more scientific and reasonable teaching policies, thereby improving teachers' sense of trust and belonging to the school, thereby enhancing their level of commitment. Good communication skills can help establish smooth information exchange channels between principals and teachers, solve problems that arise during the teaching process in a timely manner, reduce teachers' pressure, and thereby improve their job satisfaction and commitment levels.

Other studies focus more on exploring the relationship between principals' virtual instructional leadership and teacher commitment from a holistic perspective. These studies found that principals' overall performance of virtual instructional leadership had a significant positive impact on teacher commitment. In other words, when principals demonstrate strong leadership in a virtual teaching environment, teachers are more likely to have a positive emotional identification with the school and are willing to contribute to the development of the school.

When discussing the implications of the research results for theory and practice, we believe that, first of all, these research results provide an important reference for university administrators. By understanding the specific impact mechanism of principals' virtual instructional leadership on teachers' commitment, managers can improve their leadership abilities in related fields in a targeted manner, thereby more effectively stimulating teachers' work enthusiasm and creativity. Secondly, these research results also help to promote the development of related theories. By comparing and analyzing the results of different studies, we can discover the shortcomings and limitations of existing theories in explaining the relationship between principals' virtual instructional leadership and teacher commitment, thereby providing ideas and directions for subsequent theoretical innovation.

In addition, we also note that although most studies support the view that principals' virtual instructional leadership has a significant impact on teacher commitment, a few studies have reached different conclusions. These differences may be due to aspects such as research methods, sample selection, or data interpretation. Therefore, in future research, we need to further refine the research design and improve the reliability and validity of the research to more accurately reveal the true relationship between principals' virtual instructional leadership and teacher commitment. At the same time, we should also pay attention to other factors that may affect teachers' commitment, such as teachers' personal characteristics, school teaching environment, etc., in order to build a more comprehensive and systematic theoretical framework.

CONCLUSION

6.1 Finding

This study draws a series of important research conclusions by in-depth exploring the impact of principals' virtual instructional leadership on university teachers' commitment. First, this study verified the significant relationship between principals' virtual instructional leadership and college teachers' commitment. This finding not only responded to the research purpose and questions, but also further verified the rationality of the research hypothesis. Specifically, the improvement of principals' virtual instructional leadership has been proven to effectively enhance teachers' organizational commitment, thereby improving their teaching motivation and job satisfaction.

During the research process, we adopted a systematic literature review method to comprehensively sort out the research in related fields at home and abroad. Through comparative analysis and empirical research, we found that virtual instructional leadership plays a crucial role in stimulating teachers' intrinsic motivation, improving teaching quality, and promoting overall school development. This conclusion not only enriches the existing theoretical system of instructional leadership, but also provides strong theoretical support for university management practice.

In addition, this study also provides an in-depth analysis of the specific impact mechanism of each dimension of principals' virtual instructional leadership on teacher commitment. For example, leaders' clear goal and expectation setting can significantly increase teachers' goal commitment, while leaders' effective communication and interaction in virtual environments can help enhance teachers' affective commitment. These findings provide more targeted improvement strategies for university administrators, helping them to better demonstrate leadership effectiveness in actual work.

In terms of contribution, this study not only provides new research perspectives and ideas for the academic community, but also provides practical management tools and methods for university managers. By combining specific cases and data analysis, we demonstrate the great potential of principal' virtual instructional leadership in practical applications, further promoting the integration of research and practice in this field.

In summary, this study draws a series of conclusions with theoretical and practical significance by in-depth exploring the impact of principal's virtual instructional leadership on the commitment of college teachers. The principal's virtual instructional leadership consists of six ability elements: strategic leadership ability, change promotion ability, technology application and resource sharing ability, virtual communication and coordination ability, digital learning development ability and virtual culture construction ability. These conclusions not only verify the rationality of the research hypotheses, but also provide strong support and guidance for university management practice. In the future, we will continue to pay attention to the latest developments in this field, to contribute more to the sustainable development of instructional leadership in colleges and universities.

6.2 Research limitations and future directions

When exploring the research topic of the impact of principals' virtual instructional leadership on university teachers' commitment, we will inevitably face some research limitations. First, the sample size of this study may not be sufficient to fully reflect the actual situation of all colleges and universities. Due to time, resource and manpower constraints, we can only collect data to a limited extent, which may cause the representativeness of the results to be affected to a certain extent. Future research can improve the generalizability and reliability of the research by expanding the sample size to cover more types and levels of colleges and universities.

Secondly, this study mainly focused on the direct impact of principals' virtual instructional leadership on teacher commitment, but failed to explore in depth the mediating variables or moderating factors. For example, factors such as teachers' personal characteristics, the school's organizational climate, and the external environment may have important influences on the relationship between principal leadership and teacher commitment. Future studies can further explore these potential factors to reveal more complex and nuanced mechanisms of action.

In view of the above research limitations, we propose the following future research directions and improvement suggestions. First, researchers can conduct multi-level comparative studies to explore the similarities and differences in the relationship between principals' virtual instructional leadership and teacher commitment under different university types, regions and cultural backgrounds. This will help reveal more general and specific laws and provide more targeted guidance for university management practices.

Second, future research can further focus on the interaction between principals' virtual instructional leadership and other important educational variables. For example, one can explore how principal leadership interacts with teachers' professional development, students' academic achievement, and overall school performance to form a more comprehensive and systematic research framework.

Finally, researchers can draw on theories and methods from other subject areas to enrich and expand the content of this study. For example, advanced theories in the fields of organizational behavior, psychology, and management can be introduced, combined with empirical research methods, to deeply analyze the internal mechanism and external manifestations of principals' virtual instructional leadership on teachers' commitment. This will help enhance the theoretical depth and practical value of the research, and provide more scientific and powerful support for university management and educational reform.

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