Humanities and Social Sciences Letters
2026 Vol. 14, No. 1, pp. 232-251
ISSN(e): 2312-4318
ISSN(p): 2312-5659
DOI: 10.18488/73.v14i1.4702

Examining the influence of leadership styles, work concerns, and cultural norms on teacher effectiveness in digital teaching: A SEM and regression analysis in Chinese private universities

Liang Mingyu[1]
Mohd Khairuddin Abdullah[2+]
Connie Shin[3]

[1,2,3]*Faculty of Education and Sport Studies, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia.*
[1]*Email: liang_mingyu2024@outlook.com*
[2]*Email: khair@ums.edu.my*
[3]*Email: connieompok@ums.edu.my*

(+ Corresponding author)

Article History
Received: 10 June 2025
Revised: 5 December 2025
Accepted: 31 December 2025
Published: 14 January 2026

Keywords
Cultural norms
Leadership styles
Multiple regression
Structural equation modeling
Teacher effectiveness
Work concerns.

ABSTRACT

This study investigates the influence of leadership styles, work concerns, and cultural norms on teacher effectiveness in digital teaching environments within the context of young teachers who are employed in Shandong's private universities in China. This research was driven by the need to better understand how organizational and cultural factors predict teacher effectiveness in the digital teaching environment. A quantitative research approach was adopted, gathering responses from 416 participants in four private universities, and then the data were processed using structural equation modeling (SEM) and multiple regression techniques. The results show that transactional leadership has the strongest impact on teacher effectiveness, particularly in enhancing the dimensions including instructional planning and classroom management. This study found that transformational leadership, work concerns, and cultural norms also significantly influence teacher effectiveness to different extents. The SEM analysis confirmed that the proposed model fits the data well. Further, the multiple regression analysis revealed that the intellectual stimulation dimension of transformational leadership and the contingent reward dimension of transactional leadership were particularly influential in predicting teacher effectiveness. These findings suggest that leadership in private universities should remain adaptable, with an emphasis on creating supportive environments where teachers feel valued and professionally engaged. Based on these findings, it is recommended that educational administrators provide targeted leadership development programs and establish policies that prioritize teacher support, especially as private universities continue to expand digital teaching practices.

Contribution/Originality: This study contributes to existing literature by examining the combined influence of leadership styles, work concerns, and cultural norms on teacher effectiveness in digital teaching contexts, focusing on young teachers in Chinese private universities using both SEM and regression analyses.

1. INTRODUCTION

Teacher effectiveness has been a sustained focus of educational research because it is closely linked to both the quality of instruction and student achievement (Hill, Mancenido, & Loeb, 2021). Unlike teacher competence or general job performance, teacher effectiveness specifically involves the final outcome of teachers in actual teaching scenarios (Annan-Brew, Ezugwu, Surman, & Dadzie, 2024; Burgess, 2019). Therefore, teacher effectiveness can help promote professional development, improve teaching quality, and ultimately enhance students' learning achievement (Darling-Hammond, Hyler, & Gardner, 2017). In recent years, the growing incorporation of digital technology into education has progressively transformed conventional teaching approaches, especially within universities and colleges (Martin

& Xie, 2022). This shift toward digitalization calls for a renewed examination of the elements influencing teacher effectiveness, particularly for early-career educators in private universities. Identifying the critical influences on teacher effectiveness is essential for improving educational outcomes within technology-driven learning environments.

1.1. Problem Statement

Existing research typically categorizes factors that affect teacher effectiveness into external and internal factors. Common external factors often include: the environment of universities and the management of school principals, while the main internal factors consist of the teacher's work engagement and concerns, etc. For example, teachers in workplaces that offer more encouraging and professionally supportive settings are likely to develop their teaching effectiveness progressively, in contrast to those working in less supportive conditions (Kraft & Papay, 2014). Teachers who are effective in their work often demonstrate greater perseverance when encountering challenges in the classroom and are more likely to explore innovative approaches to assist students in mastering complex topics (Shu, 2022). Some scholars have pointed out that this type of categorization might, in fact, be a bit too simple because it seems to overlook the possible influence of cultural factors. Actually, the school cultural norms, which include interpersonal relationships, professional ethics, values, institutional construction, and work atmosphere, may also have a significant influence on the professional development of teachers. For example, Said, Sharif, and Abdullah (2023) emphasized that culture and community expectations significantly influence leadership behavior in educational environments. They also explained that subjective norms play an important role in leadership dynamics. Therefore, in order to solve this problem, this study considered cultural norms together with leadership style and work concerns to develop a better understanding of how the factors impact teacher effectiveness.

There is another problem to solve, which is the special challenges faced by young teachers working in Chinese private universities. Some researchers have pointed out that private universities in China are very different from international ones. The differences mainly occur in aspects such as operation mode, resource allocation, and social recognition (Wang, 2022). For example, most private universities in China suffer from limited financial resources due to the lack of government support. Even worse, their social recognition remains relatively low, and the level of teaching quality is still underdeveloped (Yu, 2025). These conditions could result in special challenges for young teachers working in Chinese private universities. These challenges mainly include a lack of guidance in instructional skills and insufficient access to systematic professional development support, which may lead to a negative impact on their teaching performance (Wu, 2023). In response to these concerns, this study focuses on young teachers and aims to seek approaches that can help improve their professional growth and teaching effectiveness within the digital environment. This study also examines how leadership styles, work concerns, and cultural norms influence teacher effectiveness. It is important to understand these factors for developing instructional management practices that could enhance teacher effectiveness and student outcomes.

1.2. Research Objectives

i. To examine the levels of leadership, cultural norms, work concerns, and teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities.
ii. To explore the correlation between leadership style, cultural norms, work concerns, and teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities.
iii. To analyze the influence of leadership style, cultural norms, and work concerns on teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities.

1.3. Research Questions

Based on the above objectives, this research comprises the following key research questions:

i. What is the current level of leadership styles, cultural norms, work concerns, and teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities?
ii. What is the relationship between leadership styles, cultural norms, work concerns, and teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities?
iii. To what extent do leadership styles, cultural norms, and work concerns influence teacher effectiveness in digital teaching environments within the context of young teachers who are teaching in Shandong's private universities?

1.4. Research Hypothesis

H_1: There is a significant relationship between leadership styles and teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities.

H_2: There is a significant relationship between cultural norms and teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities.

H_3: There is a significant relationship between work concerns and teacher effectiveness within the context of young teachers who are teaching in Shandong's private universities.

H_4: Leadership styles significantly predict teacher effectiveness in digital teaching environments within the context of young teachers who are teaching in Shandong's private universities.

H_5: Cultural norms significantly predict teacher effectiveness in digital teaching environments within the context of young teachers who are teaching in Shandong's private universities.

H_6: Work concerns significantly predict teacher effectiveness in digital teaching environments within the context of young teachers who are teaching in Shandong's private universities.

2. LITERATURE REVIEW

2.1. Teacher Effectiveness

Teacher effectiveness is the extent to which a teacher can support and advance student learning outcomes and development. It reflects the teacher's competence in designing engaging lessons, maintaining a supportive classroom environment, effectively delivering instruction, and evaluating student progress to foster academic achievement (Akram, 2018). In fact, teacher effectiveness is a multidimensional concept, which includes various aspects of instructional performance (Sabharwal & Miah, 2024). In this study, teacher effectiveness can be divided into three key dimensions: teaching plans and strategies, the learning environment, and assessment.

Teaching Plans and Strategies: This dimension refers to the extent to which teachers practice clear instructional plans and implement effective teaching strategies to enhance student learning outcomes. It mainly encompasses how teachers design the course content, select appropriate teaching methods, and obtain information about student learning outcomes. In fact, teaching plans and strategies can be seen as a structured sequence of actions aimed at achieving specific teaching and learning goals. Effective teachers are those who can develop well-organized, goal-oriented lesson plans and employ diverse instructional techniques to actively engage students and facilitate meaningful learning (Meng, 2023).

Learning Environment: The learning environment refers to the external conditions that influence teaching and learning. It means that an effective learning environment is characterized by a supportive and well-managed atmosphere that encourages creativity, collaboration, and critical thinking (Pickett & Fraser, 2010). In fact, teachers are very important to foster digital learning environments, not only for academic development but also for students' emotional growth (Cardenal, Díaz-Santana, & González-Betancor, 2023).

Assessment: The assessment dimension focuses on the extent to which teachers employ appropriate and diverse evaluation methods to monitor student learning and provide constructive feedback. In this study, effective assessment practices involve designing meaningful tasks, gathering student performance information, evaluating instructional

evidence, and using feedback to adjust instructional strategies to increase student progress (Akram, 2018; Hooda, Rana, Dahiya, Rizwan, & Hossain, 2022). Interestingly, such practices aim not only to measure student learning outcomes but also to foster continuous growth and improvement through feedback.

In recent years, some researchers have emphasized that continuous teacher professional development programs, particularly those that offer collaborative learning environments, hands-on training, and institutional support, can significantly enhance teachers' attitudes, confidence, and ability to integrate digital teaching tools (Amemasor, Oppong, Ghansah, Benuwa, & Essel, 2025). They also highlighted a strong positive relationship between the design quality of these programs and the effectiveness of digital teaching.

2.2. Leadership Style

It seems that leadership styles within universities and colleges greatly influence the effective adoption of digital technologies. Nowadays, educational leaders are likely expected to go beyond traditional administrative tasks. More and more, they are being called upon to act as visionaries who can lead their institutions through the complex and sometimes unpredictable changes that arise from digital transformation in education. Similarly, Ramaila and Molwele (2022) point out that leaders must not only manage administrative tasks but also create a shared vision that aligns with technological development to enhance teaching and learning. A study by Akram, Abdelrady, Al-Adwan, and Ramzan (2022) emphasizes the critical role of educational leaders in shaping a culture that supports technology integration. In this study, two kinds of leadership styles are considered. Transformational leadership, which seems to contribute to inspiring and motivating staff towards innovation, has been identified as very helpful in promoting the adoption of digital tools (Türk, 2023). In contrast, transactional leadership focuses on clear tasks and rewards. It may be insufficient to offer the flexibility required in dynamic digital contexts (Siswadhi & Rony, 2024). In fact, diverse leadership styles play a pivotal role in creating supportive digital teaching environments, which are essential for enhancing teacher effectiveness (Dul, Sam, Hak, Vy, & Kheuy, 2024; Zhu & Tabajen, 2024).

2.3. Work Concerns

Work concerns often refer to the various emotional and cognitive responses when individuals regard their professional roles. It consists of thoughts, doubts, and reflections related to specific tasks or issues. These concerns could be led by multiple elements, such as the intensity of work responsibilities, challenges in balancing work and personal commitments, access to professional development, and experiences of classroom management (Perreira, Berta, Ginsburg, Barnsley, & Herbert, 2018; Rahiman & Kodikal, 2017). In the educational context, work concerns could be recognized as critical factors influencing teacher performance (Guoba, Žygaitienė, & Kepalienė, 2022). Work concerns are originally conceptualized by Fuller (1969) who believed that teacher concerns can go through several stages: from no teaching concerns to concerns about self, task, and ultimately impact. George, Hall, Stiegelbauer, and Litke (2008) further classified work concerns into three core dimensions: self-concern, task-concern, and impact-concern. Based on these researches, work concerns in this study are examined through the following three dimensions.

Self-Concern: It refers to a teacher's attention to personal needs, emotions, and professional status. If well managed, it can encourage professional growth; if not, it may hinder teaching effectiveness (Baranik, Zhu, Wang, & Zhuang, 2022; Hall, 1985).

Task-Concern: This dimension reflects a teacher's focus on their responsibilities and maintaining high quality in their instructional and professional duties. In fact, it shows a strong sense of accountability and work ethic (Harini, Suyahmo, & Handoyo, 2018).

Impact-Concern: Impact-Concern pertains to the perceived significance of a teacher's work in influencing students, peers, and the educational environment at large. This dimension reflects a teacher's sense of purpose and professional contribution (Tschannen-Moran & Hoy, 2001).

2.4. Cultural Norms

The cultural norms within a university encompass the commonly held values, beliefs, and practices that collectively define the teaching and learning atmosphere of the institution (Deal & Peterson, 2016). These norms impact both instructional methods and the social-emotional environment on campus. They are instrumental in fostering student participation, academic success, and well-rounded personal development. For teachers, especially those early in their careers, these norms serve as an important contextual factor that can significantly affect their attitudes, behaviors, and overall effectiveness (Hargreaves, 2001).

Young teachers often encounter unique challenges in private universities. For example, they may face high workloads, limited institutional support, and a lack of mentorship (Qureshi, 2016). Furthermore, school cultural norms can either facilitate or hinder teachers' professional development. A positive and supportive school culture, marked by collaboration and a shared vision, can provide young teachers with guidance, resources, and encouragement. However, a negative cultural climate may lead to professional dissatisfaction, reduced motivation, and a risk of burnout (Salina, 2023). Therefore, in this study, cultural norms are examined as a key contextual variable influencing the effectiveness of young teachers in private universities.

2.5. Research Gaps

Although previous studies have shown that leadership plays an important role in increasing teachers' motivation and active engagement in their work (Leithwood & Jantzi, 2005; Meng, 2023). There are still some limitations in understanding how different leadership styles interact with young teachers' work concerns and cultural norms, especially in the context of digital teaching within private universities in China. To address this gap, this study examines the combined influence of these factors on teacher effectiveness, using structural equation modeling and multiple regression analysis.

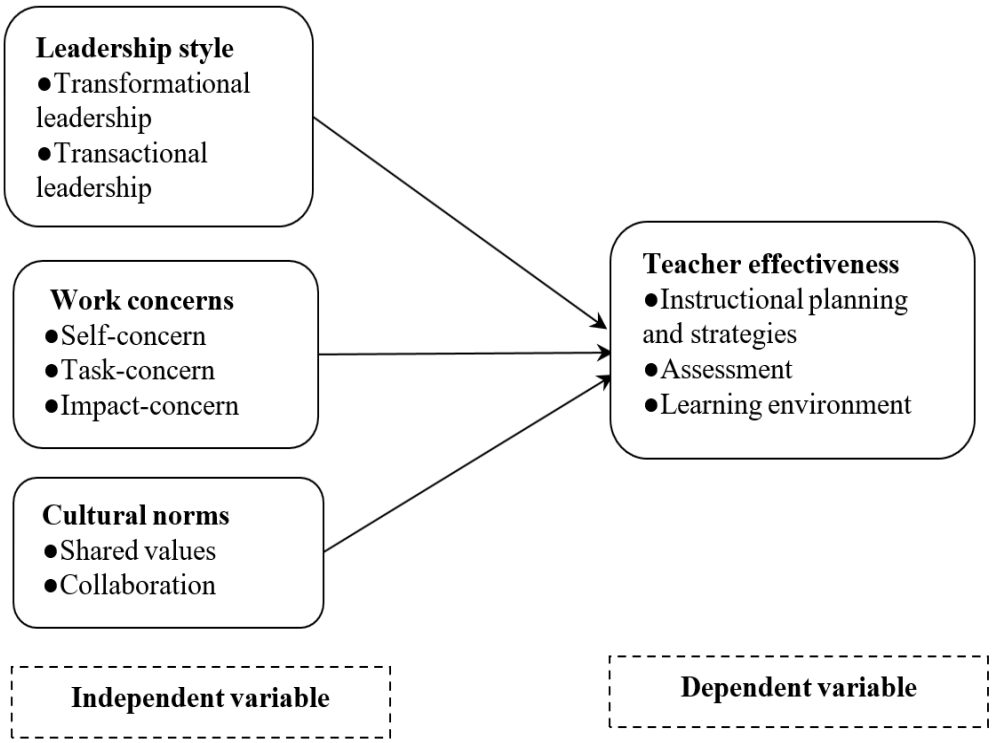

Figure 1. Theoretical framework of study.

2.6. Theoretical Framework

Figure 1 illustrates the theoretical framework of this study, showing the relationships among leadership styles, work concerns, cultural norms, and teacher effectiveness. It integrates leadership styles theory and the concerns-based adoption model (CBAM).

2.6.1. Leadership Styles Theory

Bass (1995) categorized transformational leadership into four core dimensions: Idealized Influence (II), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individualized Consideration (IC). In contrast, transactional leadership can be divided into three key components: Contingent Reward (CR), Management-by-exception (MBE), and Laissez-faire (LF) (Bass & Avolio, 1995). Actually, transformational leadership has been widely associated with improving teachers' motivation, commitment, and teaching performance. Leaders who adopt this leadership style could not only focus on task completion but also on improving teachers' personal and professional development, which is very important for young teachers within the complex digital teaching environments. This theory could be considered as a foundation in this study.

2.6.2. Concerns-Based Adoption Model (CBAM)

The Concerns-Based Adoption Model (CBAM) which is developed by Hall and Hord (1987) can offer a practical tool for analyzing the different types of concerns teachers encounter in their work conditions. It is noted that this model has been commonly used in research related to educational innovation and teacher professional development. In this study, teachers' work concerns are examined through three dimensions: self-concern, task-concern, and impact-concern (George et al., 2008). Actually, by applying CBAM, this research seeks to gain a deeper understanding of the work concerns of young teachers in private universities who are adjusting to new demands and expectations.

3. METHODS

3.1. Research Design

This study examined how leadership styles, work concerns, and cultural norms interact to influence teacher effectiveness within the context of digital teaching by a quantitative method. To evaluate the variables and test the proposed research hypotheses, this study employed a structured questionnaire as the primary instrument for data collection. This research design is suitable for gathering data from a large sample within a specific period and allows the use of statistical methods such as Structural Equation Modeling (SEM) and multiple regression analysis to test and validate the theoretical framework.

3.2. Population and Sample

This study focused on young teachers who are teaching in private universities located in Shandong Province of China. Shandong was selected as the research site because of its large population and its prominent role as a center for higher education. In addition, the province is known for its rapid advancement and widespread adoption of digital teaching practices. There is a large number of early-career teachers in private universities and colleges in Shandong. According to the Chinese Ministry of Education, young teachers in this research are defined as those under the age of 40, with less than ten years of teaching experience, and holding at least a master's degree.

In this study, data was collected from four representative private universities in Shandong Province: Hengxing University (HXU), Shandong Vocational and Technical University of Engineering (SDVTUE), Liaocheng University Dongchang College (LCUDCC), and Qingdao Qiushi College (QDQSC). It is noted that these universities were carefully selected based on their size, diversity, and educational goals to ensure their representativeness. The distribution of respondents among the four universities is presented in Table 1. The sampling ratios in each university

ranged from 16.36% to 25%, with an overall sampling ratio of 19.21%, which is considered adequate for ensuring sample representativeness.

Table 1. Distribution of samples of private universities young teachers in Shandong province.

University name	Population	Number of samples	Sampling ratio (%)
HXU	445	106	23.82
SDVTUE	850	140	16.47
LCUDCC	320	80	25
QDQSC	550	90	16.36
Total	2165	416	19.21

The data were gathered through a structured questionnaire. Based on statistics from the Chinese Ministry of Education, the estimated number of young teachers working in Shandong's private universities is approximately 22,500. Referring to Krejcie and Morgan (1970) sample size table, the minimum required sample for this population is 379. In this study, a total of 416 valid responses were obtained, exceeding the recommended sample size. The sampling was conducted through a multistage process combining stratified sampling, purposive selection of universities, and simple random sampling of participants within each selected institution. This method ensured balanced representation across different private university categories.

The research was conducted using the Wenjuanxing online survey platform. It should be noted that ethical approvals were obtained from the four participating universities. Additionally, all participants were fully informed of the purpose of the study and provided their voluntary consent before completing the survey. They were assured that their identities would remain anonymous and that all responses would be treated with strict confidentiality and used solely for academic purposes.

3.3. Instruments

The questionnaire used in this study consists of five parts: demographic information, leadership styles, work concerns, cultural norms, and teacher effectiveness. To ensure the validity of the measurement, the questionnaire included items adapted from well-established instruments. These instruments are, respectively, the Multifactor Leadership Questionnaire (Bass & Avolio, 2004), the Stages of Concern Questionnaire (SoC) (George et al., 2008), the School Culture Survey (Sagor, 1996), and the School Teacher Effectiveness Questionnaire (STEQ) (Akram, 2018). As shown in Table 2, there are 95 questions in the final questionnaire, including five items related to demographic background and 90 items covering the research variables. Every item was scored using a 5-point Likert scale, ranging from 1 ("Strongly disagree") to 5 ("Strongly agree").

Table 2. Distribution of items.

Variables	Dimensions	Items
Transformational leadership	• Idealized influence (II) • Inspirational motivation (IM) • Intellectual stimulation (IS) • Individualized consideration (IC)	21 items
Transactional leadership	• Contingent reward (CR) • Management-by-exception (MBE) • Laissez-faire (LF)	13 items
Work concerns	• Self-concern • Task-concern • Impact-concern	25 items
Cultural norms	• Shared values • Collaboration	14 items
Teacher effectiveness	• Instructional planning and strategies • Assessment • Learning environment	17 items

Section A: Demographic Information

This section could be used to gather participants' basic background information, which covers gender, age, teaching experience, qualifications, and subject area. In this part, respondents are asked to mark options.

Section B: Leadership Style

In this study, leadership style was measured by a scale adapted from the Multifactor Leadership Questionnaire (MLQ) developed by Bass and Avolio (2004).

Section C: Work Concerns

Work concerns of young teachers could be measured by the Stages of Concern Questionnaire (SoC), which is introduced by George et al. (2008). This scale could be divided into three dimensions: self-concern, task-concern, and impact-concern.

Section D: Cultural Norms

Cultural Norms of private universities could be assessed through the School Culture Survey, which was developed by Sagor (1996). It includes two dimensions: shared values and collaboration.

Section E: Teacher Effectiveness

In this study, teacher effectiveness can be assessed by three core dimensions: instructional planning and strategies, assessment, and learning environment, which are derived from the framework provided by Akram (2018). This section focuses on evaluating teachers' classroom performance, their ability to organize learning effectively, and their strategies for actively engaging students.

3.4. Validity and Reliability

It is necessary to conduct expert evaluations to ensure the content validity of the questionnaire in this study. Subsequently, a pilot test involving 288 participants was carried out to further examine the validity and reliability of the instrument. In this part, Confirmatory Factor Analysis (CFA) was performed to assess construct validity, and the internal consistency of the scales was tested using Cronbach's alpha and composite reliability (CR). The results showed that all measurement scales demonstrated acceptable consistency, with Cronbach's alpha values ranging from 0.825 to 0.927, and an overall alpha of 0.974. Convergent validity was supported, as all CR values exceeded 0.7, and the Average Variance Extracted (AVE) values for each dimension were above the 0.5 threshold. These findings confirm that the measurement tool used in this study is both valid and reliable.

3.5. Data Analysis

The collected data were processed using SPSS and AMOS. Descriptive statistics summarized the levels of each measured variable. Pearson correlation analysis examined the relationships among the variables in this study. Structural Equation Modeling (SEM) was employed to test the proposed theoretical framework by analyzing the structural relationships and the direct effects of leadership styles, work concerns, and cultural norms on teacher effectiveness. The model's goodness of fit was evaluated using commonly accepted indices, including CFI, TLI, RMSEA, and SRMR. Additionally, multiple regression analysis was conducted to further investigate the predictive influence of each dimension in leadership styles, work concerns, and cultural norms on the dimensions of teacher effectiveness.

4. FINDINGS

4.1. Demographic Characteristics

The demographic overview of the 416 participants, as presented in Table 3, shows that female respondents (57.7%) outnumbered male respondents (42.3%) in this study, indicating a higher proportion of female young teachers in Shandong's private universities. Most of the teachers surveyed were between 25 and 30 years old (39.4%), while a smaller group fell within the 35-40 age range (25.7%), suggesting that the teaching workforce is generally young. It

also shows that more than half of the participants (55%) had between one to five years of teaching experience, which aligns with the study's emphasis on early-career teachers. Regarding academic qualifications, 78.4% of the respondents possessed a master's degree, while 21.6% held doctoral degrees. In terms of teaching disciplines, the largest group specialized in Arts, Social Sciences, and Humanities (29.8%), followed by Computing and Science (22.1%), and academic subjects such as Chinese, English, and Mathematics (19%). This diverse and large young sample could provide a strong foundation for examining the influence of leadership styles, work concerns, and cultural norms on teacher effectiveness in private universities in Shandong province.

Table 3. Demographic characteristics (n = 416).

Demographic profile	Frequency (f)	Percentage (%)
Gender		
Male	176	42.3
Female	240	57.7
Age		
25 and below	72	17.3
25-30 years	164	39.4
30-35 years	107	25.7
35-40 years	73	17.5
Teaching Experience		
1 year and below	31	7.5
1-5 years	229	55
5-10 years	76	18.3
more than 10 years	80	19.2
Qualification		
Master's Degree	326	78.4
Doctoral Degree	90	21.6
Subject Area		
Academic Subjects (e.g., Chinese, English, Mathematics)	79	19
Computing and Science	92	22.1
Arts, Social Sciences, and Humanities	124	29.8
Medicine and Pharmacy	35	8.4
Engineering and Technology	75	18
Others	11	2.6

4.2. Common Method Bias (CMB) Test

Common method bias (CMB) is a potential concern in survey research, particularly when data are collected from a single source, when item formats are consistent, or when the structure of the measurement instruments contributes to shared variance (Podsakoff, Podsakoff, Williams, Huang, & Yang, 2024). Such bias may artificially inflate the relationship between independent and dependent variables. It potentially leads to systematic measurement errors. In questionnaire surveys, responses can be influenced by both systematic and random factors, and shared method variance may compromise the accuracy of statistical results.

To assess the potential presence of common method bias in this study, Harman's single-factor test was conducted following the procedure recommended by Kock (2020). In this procedure, all questionnaire items were examined by exploratory factor analysis (EFA) with principal component extraction. The results in Table 4 show that there are 14 components extracted with their eigenvalues greater than one. The first component could explain 36.23% of the total variance, which is less than the commonly accepted threshold of 40%. The remaining factors accounted for the rest of the variance, with the cumulative variance explained reaching 68.93%. As no single component emerges as dominant, the results indicate that CMB is not a significant concern in this study. Therefore, the dataset is considered suitable for further empirical analysis.

Table 4. Result of the common method bias test.

Component	Extraction sums of squared loadings		
	Total	Variance %	Cumulative %
1	32.607	36.23	36.23
2	4.532	5.036	41.266
3	3.935	4.372	45.638
4	3.144	3.494	49.131
5	2.891	3.213	52.344
6	2.455	2.728	55.072
7	2.204	2.449	57.521
8	2.059	2.288	59.809
9	1.832	2.035	61.845
10	1.542	1.714	63.558
11	1.426	1.584	65.142
12	1.288	1.432	66.574
13	1.087	1.207	67.781
14	1.032	1.146	68.928

4.3. Descriptive Analysis

Descriptive statistics were performed using SPSS to describe the central tendency, variability, and distribution of the main variables. The mean scores reflected the general perceptions of participants, while the standard deviation (SD) represented the degree of variation in responses. Skewness was assessed to examine the symmetry of the data distribution, where negative values indicated that most responses were above the average. Kurtosis values were also evaluated to understand the flatness or peakedness of the distribution, with values close to zero suggesting a normal distribution (Bulanov et al., 2021).

As shown in Table 5, Cultural Norms recorded the highest average score (M = 3.617), followed by Work Concerns (M = 3.567) and Transformational Leadership (M = 3.537). These results suggest that respondents generally had positive perceptions of these areas. Transactional Leadership had the lowest mean score (M = 3.353), indicating a relatively lower level of favorable perception compared to other variables. It also demonstrates that Transformational Leadership showed the greatest variability (SD = 0.792) with a wider range of responses among all measured factors.

As for the skewness, we found that all variable values ranged from -0.605 to -1.033, indicating a slight negative skew, which means that most responses were above the average. Additionally, the kurtosis values ranged from -0.106 to 0.324, remaining close to zero, suggesting that the distributions were approximately normal.

Table 5. Descriptive statistics results.

Variable	Number of items	M (Mean)	SD (Standard deviation)	Skewness	Kurtosis
Transformational leadership	21	3.537	0.792	-0.96	0.216
Transactional leadership	13	3.353	0.754	-0.605	0.045
Work concerns	25	3.567	0.766	-1.033	0.324
Cultural norms	14	3.617	0.720	-0.866	0.220
Teacher effectiveness	17	3.375	0.785	-0.7	-0.106

Table 6. Result of multicollinearity test.

Predictor variable	Tolerance	VIF
Idealized influence	0.416	2.405
Inspirational motivation	0.429	2.332
Intellectual stimulation	0.426	2.345
Individualized consideration	0.444	2.25
Contingent reward	0.516	1.939
Management-by-exception	0.46	2.174
Laissez-faire	0.552	1.811

Predictor variable	Tolerance	VIF
Self concern	0.488	2.049
Task concern	0.313	3.2
Impact concern	0.441	2.27
Shared values	0.455	2.2
Collaboration	0.538	1.857
Instructional Planning and Strategies	0.397	2.522
Assessment	0.369	2.708
Learning environment	0.334	2.991

4.4. Multicollinearity Test

Usually, multicollinearity may occur when independent variables in a regression model are strongly correlated. It potentially affects the accuracy of coefficient interpretation (Salmerón, García, & García, 2020). In this study, multicollinearity was excluded by examining the Variance Inflation Factor (VIF) and tolerance values. According to the results in Table 6, all VIF values were well below the accepted threshold of 10, and all tolerance values exceeded 0.1. The VIF values in this study ranged from 1.811 to 3.200, and the lowest tolerance value was 0.313. The variable "Task Concern" showed the highest VIF at 3.200, while "Laissez-faire" had the lowest VIF at 1.811. All other predictors also met the multicollinearity standards, indicating no serious multicollinearity problem among the variables in this analysis.

4.5. Correlation Analysis

As presented in Table 7, the correlation analysis revealed positive and significant associations between the dependent variable and the independent variables. Specifically, the correlation coefficient between teacher effectiveness and transformational leadership was 0.794, followed by transactional leadership at 0.690, work concerns at 0.783, and cultural norms at 0.691. All relationships were statistically significant at the 0.01 level, as indicated by the corresponding p-values. These results indicate that transformational leadership, transactional leadership, cultural norms, and work concerns are all positively related to teacher effectiveness in this study.

Table 7. Correlation analysis result.

Variable	Transformational leadership	Transactional leadership	Work concerns	Cultural norms	Teacher effectiveness
Transformational leadership	1				
Transactional leadership	0.575**	1			
Work concerns	0.704**	0.621**	1		
Cultural norms	0.605**	0.641**	0.607**	1	
Teacher effectiveness	0.794**	0.690**	0.783**	0.691**	1

Note: ** indicates p< .01 (2-tailed). Values represent Pearson correlation coefficients.

4.6. Structural Equation Model (SEM) Fit Analysis

Before conducting regression analysis, it was necessary to assess the suitability of the overall model using Structural Equation Modeling (SEM). Unlike traditional regression, which typically addresses one-directional linear effects, SEM allows for the simultaneous analysis of complex, multi-variable relationships (Kline, 2023). Therefore, this study employs SEM to test the overall model fit and utilizes path analysis to explore the causal relationships among variables, serving as a basis for subsequent regression analysis (Hair, Babin, Anderson, & Black, 2022). The SEM path analysis was performed using AMOS 26.0, with the results in Figure 2.

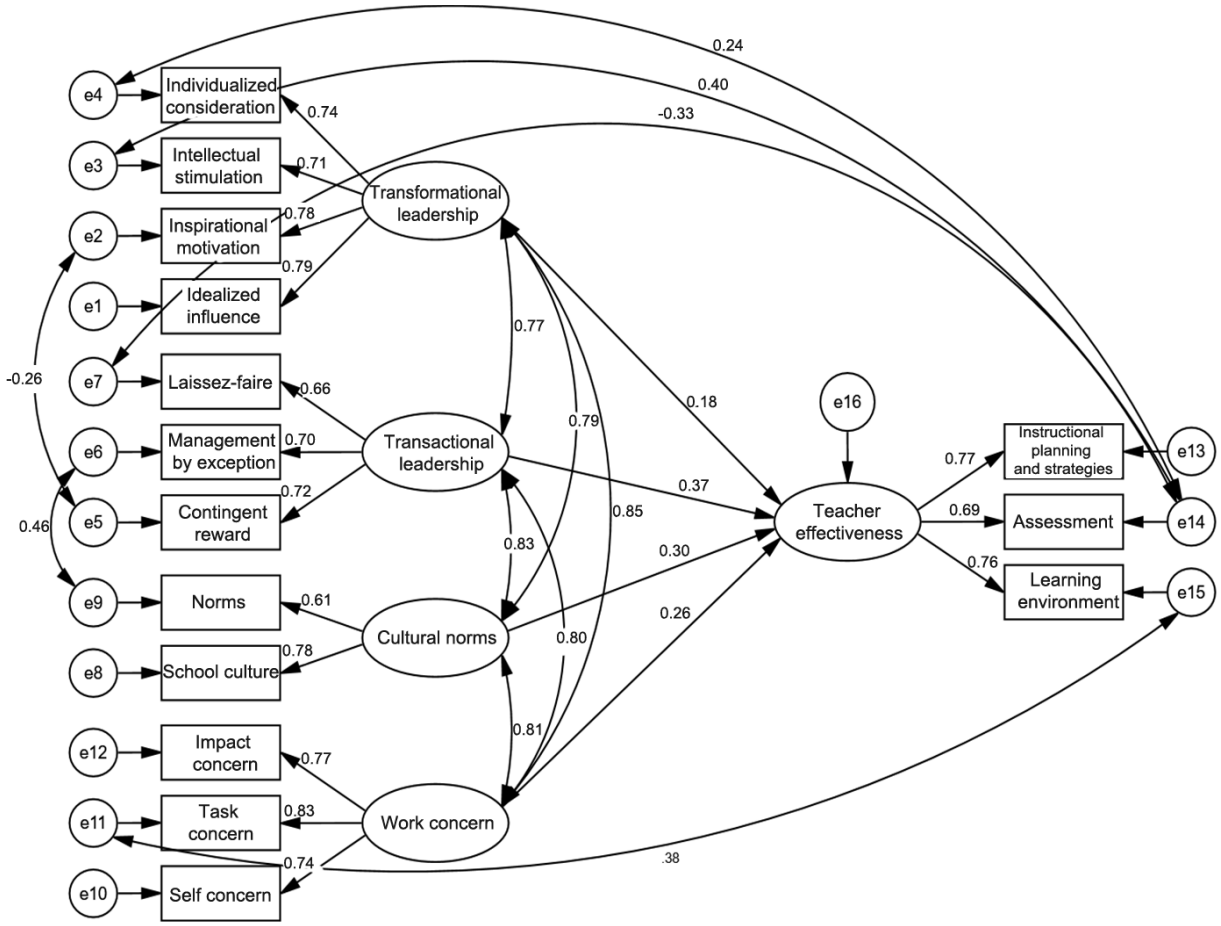

Figure 2. The standardized results of the structural equation model (SEM).

Table 8. Structural equation model (SEM) fit.

Index	X^2/df	GFI	AGFI	IFI	TLI	CFI	RMSEA
Statistical Value	3.302	0.930	0.886	0.935	0.934	0.953	0.074
Reference Value	<5	>0.8	>0.8	>0.9	>0.9	>0.9	<0.08
Fit Status	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved

The fit indices for the structural equation model (SEM) summarized in Table 8, met the established benchmarks. The ratio (χ^2/df) was 3.302, which is within the acceptable limit of less than 5, indicating that the model adequately represents the data. The GFI (0.930) and AGFI (0.886) both surpassed the minimum requirement of 0.8. Additionally, the IFI (0.935), TLI (0.934), and CFI (0.953) all exceeded the recommended value of 0.9, reflecting a satisfactory model fit. The RMSEA (0.074) was found to be below the acceptable threshold of 0.08, further verifying that the model aligns well with the dataset. These results demonstrate that the model in this study is confirmed to be acceptable for proceeding with path analysis.

Table 9. Path coefficient analysis of the SEM.

Path hypothesis relationship	Standardized path coefficient	Standard error (S.E.)	Critical ratio (C.R.)	p-value
Teacher effectiveness ← Transformational leadership	0.183	0.09	2.125	0.034
Teacher effectiveness ← Transactional leadership	0.368	0.101	3.879	***
Teacher effectiveness ← Cultural norms	0.298	0.127	2.622	0.009
Teacher effectiveness ← Work concerns	0.262	0.109	2.638	0.008

Note: *** indicates $p < .001$

Table 9 presents the results of the path coefficient analysis, indicating that all proposed relationships in the structural equation model (SEM) were statistically significant. The effect of transformational leadership on teacher effectiveness was positive ($\beta = 0.183$, $p = 0.034$), though its impact was relatively smaller when compared to the other predictors. Transactional leadership showed a stronger positive influence ($\beta = 0.368$, $p < 0.001$), suggesting it plays a more substantial role in enhancing teacher performance.

Additionally, cultural norms ($\beta = 0.298$, $p = 0.009$) and work concerns ($\beta = 0.262$, $p = 0.008$) were found to significantly predict teacher effectiveness. These findings highlight the significant roles that institutional culture and teachers' work-related perceptions play in shaping educational outcomes. All critical ratios (C.R.) exceeded the benchmark value of 1.96, indicating that the identified paths are statistically significant. Overall, the results support the validity of the proposed model and reinforce the importance of leadership styles, cultural norms, and work concerns in influencing teacher effectiveness.

4.7. Regression Analysis

Regression analysis at the dimensional level allows for the identification of specific factors that influence teacher effectiveness, providing a more nuanced understanding of how these factors interact. In this research, dimensional regression analysis was applied to evaluate the predictive contribution of each factor, providing further support for the model's theoretical structure and statistical soundness (Kline, 2023; Schumacker & Lomax, 2004). As shown in Tables 10-13, the regression models achieved satisfactory fit, with R^2 from 0.272 to 0.606. These findings suggest that the independent variables account for a moderate to high proportion of the variance in teacher effectiveness dimensions. The F-tests for all models yielded significant results ($p < 0.001$), confirming that each regression equation is statistically robust. Overall, the regression models effectively explain the factors that influence teacher effectiveness.

Table 10. Multiple linear regression model (Transformational leadership).

Component	Instructional planning and strategies		Assessment		Learning environment	
	β	t	β	t	β	t
Gender	0.091	2.458*	0.028	0.808	0.072	1.918
Age	0.042	0.967	0.045	1.133	0.068	1.565
Teaching experience	0.103	2.344*	0.102	2.498*	0.109	2.462*
Qualification	-0.006	-0.166	-0.018	-0.516	0.055	1.452
Subject area	0.048	1.321	0.067	1.995*	0.044	1.2
II	0.184	3.628***	-0.013	-0.272	0.305	5.983***
IM	0.204	3.920***	0.103	2.140*	0.144	2.751**
IS	0.232	4.809***	0.405	9.064***	0.187	3.865***
IC	0.128	2.549*	0.309	6.660***	0.086	1.703
R^2	0.462		0.538		0.458	
Adjusted R^2	0.45		0.528		0.446	
F	38.778***		52.575***		38.093***	

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$.

The regression results in Table 10 indicate that among the four dimensions of transformational leadership, intellectual stimulation (IS) consistently exerts the strongest positive impact on all three components of teacher effectiveness. Specifically, IS significantly predicts instructional planning and strategies ($\beta = 0.232$, $p < 0.001$), assessment ($\beta = 0.405$, $p < 0.001$), and the learning environment ($\beta = 0.187$, $p < 0.001$). By contrast, idealized influence (II) does not have a strong influence on assessment ($\beta = -0.013$, $p > 0.05$). Similarly, individualized consideration (IC) shows no significant effect on the learning environment ($\beta = 0.086$, $p > 0.05$). These findings suggest that not all dimensions of transformational leadership equally contribute to enhancing teacher effectiveness, as some factors demonstrate limited predictive power in specific areas.

Table 11. Multiple linear regression model (Transactional leadership).

Component	Instructional planning and strategies		Assessment		Learning environment	
	β	t	β	t	β	t
Gender	0.119	3.248**	0.069	1.602	0.108	2.938**
Age	-0.003	-0.058	0.033	0.655	0.016	0.360
Teaching experience	0.146	3.365**	0.170	3.355**	0.145	3.317**
Qualification	-0.070	-1.831	-0.029	-0.655	-0.003	-0.071
Subject area	0.008	0.229	0.021	0.485	0.002	0.043
CR	0.315	7.096***	0.220	4.256***	0.376	8.432***
MBE	0.184	4.095***	0.263	5.023***	0.228	5.053***
LF	0.265	5.885***	0.029	0.546	0.129	2.860**
R^2	0.463		0.272		0.459	
Adjusted R^2	0.453		0.257		0.448	
F	43.934***		18.963***		43.080***	

Note: ** indicates $p < 0.01$, *** indicates $p < 0.001$.

The regression analysis in Table 11 indicates that the contingent reward (CR) dimension has the strongest impact on all aspects of teacher effectiveness. The laissez-faire (LF) dimension shows a positive effect on instructional planning and learning environment dimensions, but its impact on the assessment dimension is not significant (β=0.029, p>0.05).

Table 12. Multiple linear regression model (work concerns).

Component	Instructional planning and strategies		Assessment		Learning environment	
	β	t	β	t	β	t
Gender	0.089	2.292*	0.003	0.07	0.057	1.794
Age	0.012	0.264	0.036	0.798	0.003	0.069
Teaching experience	0.112	2.427*	0.112	2.466*	0.088	2.355*
Qualification	0.01	0.256	-0.003	-0.071	0.049	1.537
Subject area	0.04	1.047	0.046	1.208	0.048	1.55
Self-concern	0.105	2.026*	0.178	3.471**	0.042	0.982
Task-concern	0.274	4.895***	0.196	3.543***	0.568	12.451***
Impact-concern	0.274	5.319***	0.317	6.233***	0.193	4.595***
R^2	0.405		0.421		0.606	
Adjusted R^2	0.394		0.409		0.598	
F	34.687***		36.938***		78.326***	

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$.

Table 12 shows that the most impactful dimension of work concern is task-concern, especially in the learning environment dimension (β=0.568, p<0.001). Impact-concern also shows strong predictive power across all three dimensions of teacher effectiveness. However, self-concern has no significant influence on the learning environment dimension (β=0.042, p>0.05), suggesting its limited role in enhancing teacher effectiveness.

Table 13. Multiple linear regression model (Cultural norms).

Component	Instructional planning and strategies		Assessment		Learning environment	
	β	t	β	t	β	t
Gender	0.081	2.196*	0.014	0.361	0.081	2.012*
Age	-0.005	-0.122	0.022	0.463	0.029	0.626
Teaching experience	0.161	3.698***	0.172	3.652***	0.189	4.002***
Qualification	0.026	0.681	0.019	0.474	0.081	1.994*
Subject area	-0.009	-0.258	0.001	0.01	-0.001	-0.018
Shared values	0.491	11.571***	0.471	10.28***	0.343	7.434***
Collaboration	0.201	4.871***	0.126	2.842**	0.239	5.339***
R^2	0.458		0.37		0.36	
Adjusted R^2	0.449		0.359		0.349	
F	49.274***		34.215***		32.763***	

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$.

The findings in Table 13 show that the shared values dimension is the main predictor across all three teacher effectiveness dimensions, showing the highest β values. In contrast, the collaboration dimension has a weaker but still statistically significant influence.

5. DISCUSSION

This research focused on examining how leadership styles, cultural norms, and work concerns influence teacher effectiveness in digital teaching environments. The study specifically targeted young teachers working in Shandong's private universities. The findings successfully addressed the three primary research questions and provided several key insights.

5.1. Current Levels of Leadership Styles, Cultural Norms, Work Concerns, and Teacher Effectiveness in Digital Teaching Environments

Descriptive analysis revealed generally positive perceptions across all key variables. Among the independent variables, cultural norms had the highest mean score (M=3.617), followed by work concerns (M=3.567) and transformational leadership (M=3.537). Transactional leadership was perceived somewhat less favorably (M=3.353), although still above the midpoint, suggesting moderate implementation. Teacher effectiveness had an average score of 3.375, reflecting a comparatively strong self-assessment of professional ability among young teachers. The skewness and kurtosis values indicated an approximate normal distribution, confirming that the dataset was appropriate for subsequent statistical evaluation.

5.2. Relationships Among Leadership Styles, Cultural Norms, Work Concerns, and Teacher Effectiveness in Digital Teaching Environments

Correlation and SEM path analyses demonstrated that all three predictor variables: transformational leadership, transactional leadership, cultural norms, and work concerns, were significantly and positively correlated with teacher effectiveness (ranging from r=0.690 to r=0.794, p<0.01). The SEM results further confirmed these relationships, with transactional leadership showing the strongest direct path to teacher effectiveness (β=0.368, p<0.001), subsequently including transformational leadership (β=0.183, p=0.034), cultural norms (β=0.298, p=0.009), and work concerns (β=0.262, p=0.008). The results indicate that all three variables play a critical role in shaping the effectiveness of young teachers, and none of the variables can be overlooked in institutional leadership and support strategies.

The results align with prior studies. For example, a positive school culture strengthens teacher identity, professional growth, and motivation, leading to greater job satisfaction and improved instructional practices (Fu et al., 2022). Transformational leaders promote a vision-driven and collaborative culture, which enhances teachers' motivation, innovation, and engagement in student-centered learning (Leithwood, Sun, & Pollock, 2017). Teachers who view their work as valuable and significant tend to demonstrate higher levels of commitment and teaching effectiveness (Liu, 2024).

5.3. The Influence of Each Variable in Digital Teaching Environments

Dimensional regression analysis provided more nuanced insights. For transformational leadership, the intellectual stimulation (IS) dimension consistently emerged as the most powerful predictor of all teacher effectiveness outcomes, particularly in assessment (β=0.405, p<0.001). It indicates that promoting critical thinking and innovation among teachers can significantly enhance their performance in digital learning environments.

For transactional leadership, contingent reward (CR) was the most influential dimension, especially in shaping the learning environment (β=0.376, p<0.001), emphasizing the critical role of explicit expectations and rewards. Interestingly, the Laissez-faire dimension, typically associated with passive styles, also showed significant positive

associations, indicating a potential benefit of allowing autonomy in digital settings. In higher education, digital leadership exercised by academic leaders to promote the integration of technology and pedagogy has also attracted growing attention (Dong & Rhene, 2024). Amemasor et al. (2025) demonstrated that university teachers who exhibit outstanding digital leadership, characterized by data-driven decision-making and technological innovation, have a significant positive impact on student learning outcomes.

Within the work concerns model, both task concern and impact concern strongly predicted all three dimensions of teacher effectiveness. Notably, the task-concern dimension had the highest influence on the learning environment dimension (β=0.568, $p<0.001$), highlighting the importance of teachers' clarity and focus on instructional tasks in virtual classrooms.

Regarding cultural norms, the Shared Values dimension stood out as the most significant predictor across all outcomes, particularly for the Instructional Planning and Strategies dimension in teacher effectiveness (β=0.491, $p<0.001$). This finding indicates that a cohesive and value-driven institutional culture plays a critical role in promoting effective teaching within digital contexts. It aligns with Chinese research, which suggests that the successful implementation of digital academic leadership is often influenced by institutional types and organizational cultural factors (Jing, Guo, Wu, Yang, & Wang, 2025). These results reinforce the significance of cultural norms as an important contextual factor in digital teaching environments.

5.4. Model Fit and Predictive Power

Through data analysis, we found that all regression models fit strongly since R^2 values range from 0.272 to 0.606. The highest explanatory power was observed in the work concerns model for the learning environment (R^2=0.606), followed by the transformational leadership model for assessment (R^2=0.538). These values, alongside significant F-statistics ($p<0.001$), confirm the statistical robustness and theoretical validity of the proposed models.

5.5. Implications for Educational Management

The findings in this research highlight that transformational leadership and transactional leadership both positively influence teacher effectiveness. Therefore, there is a need for administrators to adopt flexible leadership approaches that combine vision, support, clear expectations, and rewards. Fostering a strong cultural environment, especially shared values and collaboration, can significantly enhance teaching outcomes. Addressing teachers' work concerns, particularly task clarity and impact awareness, is essential in supporting effective digital instruction. University leaders should therefore prioritize leadership development, institutional culture building, and teacher support systems to improve overall teaching performance.

5.6. Limitations and Future Research Directions

This study has several limitations. Firstly, the cross-sectional nature of the research prevents causal conclusions from being drawn regarding the relationships among the variables. Secondly, although statistical controls were applied, the use of self-reported data may still introduce potential bias. Thirdly, the research sample was confined to young teachers from private universities in Shandong Province, which could limit the extent to which the findings can be applied to broader populations.

For future studies, it is recommended to adopt longitudinal research designs and incorporate data from multiple sources to strengthen reliability and track changes over time. Further investigations could include more various types of institutions and a wider range of geographical areas. In addition, some other influential factors, such as digital competence or job satisfaction, could be considered in future research, which contribute to a deeper and more comprehensive understanding of teacher effectiveness in digital teaching contexts.

6. CONCLUSION

This study found that leadership styles, work concerns, and cultural norms all play an important role in shaping teacher effectiveness, especially for young teachers working in private universities in Shandong's digital teaching environments. The results indicated that transactional leadership, particularly through the contingent rewards dimension, has the strongest influence on improving teacher effectiveness. On the other hand, transformational leadership contributes meaningfully by motivating teachers and encouraging long-term innovation. Among the dimensions of work concerns, task concerns, and impact concerns could be considered strong predictors of teacher effectiveness. The study also found that cultural norms have a meaningful influence, especially in supporting teachers with instructional planning and strategies. These findings suggest that it is important to build supportive school cultures, use leadership approaches that can adapt to different situations, and pay attention to the real concerns teachers face in their work. Educational leaders and policymakers should pay more attention to young teachers in private universities and implement more practical interventions that could strengthen teaching effectiveness in digital teaching environments.

Funding: This study received no specific financial support.
Institutional Review Board Statement: The Ethical approval for this study was given by the Qingdao Hengxing University, China on 01 November 2024 (No. HX05241101), Liaocheng University Dongchang Colleage, China on 28 October 2024 (No. EC202401), Qingdao Qiushi College, China on 1 November 2024 (No. QS202410) and the Shandong Vocational and Technical University of Engineering, China on 29 October 2024 (No. EC202415).
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

REFERENCES

Akram, H., Abdelrady, A. H., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching-learning practices: A systematic review. *Frontiers in Psychology, 13*, 920317. https://doi.org/10.3389/fpsyg.2022.920317

Akram, M. (2018). Development and validation of school teacher effectiveness questionnaire. *Journal of Research & Reflections in Education, 12*(2), 154-174.

Amemasor, S. K., Oppong, S. O., Ghansah, B., Benuwa, B.-B., & Essel, D. D. (2025). A systematic review on the impact of teacher professional development on digital instructional integration and teaching practices. *Frontiers in Education, 10*, 1541031. https://doi.org/10.3389/feduc.2025.1541031

Annan-Brew, R. K., Ezugwu, I. J., Surman, S. H., & Dadzie, J. (2024). Enhancing pre-service teacher effectiveness: Integration of 21st-century skills during off-campus teaching experiences. *European Journal of Education, 59*(4), e12737. https://doi.org/10.1111/ejed.12737

Baranik, L. E., Zhu, Y., Wang, M., & Zhuang, W. (2022). When does witnessing patient mistreatment hurt nurses' performance? Gauging the moderation roles of self-concern and other-orientation. *Journal of Managerial Psychology, 37*(2), 170-185. https://doi.org/10.1108/JMP-05-2020-0279

Bass, B. M. (1995). Theory of transformational leadership redux. *The Leadership Quarterly, 6*(4), 463-478. https://doi.org/10.1016/1048-9843(95)90021-7

Bass, B. M., & Avolio, B. J. (1995). *Multifactor leadership questionnaire*: Mind Garden: APA PsycTests.

Bass, B. M., & Avolio, B. J. (2004). *Multifactor leadership questionnaire: Manual and sampler* (3rd ed.). Menlo Park, CA: Mind Garden.

Bulanov, N. M., Suvorov, A. Y., Blyuss, O. B., Munblit, D. B., Butnaru, D. V., Nadinskaia, M. Y., & Zaikin, A. A. (2021). Basic principles of descriptive statistics in medical research. *Sechenov Medical Journal, 12*(3), 4-16.

Burgess, S. (2019). Understanding teacher effectiveness to raise pupil attainment. *IZA World of Labor, 465*. https://doi.org/10.15185/izawol.465

Cardenal, M. E., Díaz-Santana, O., & González-Betancor, S. M. (2023). Teacher-student relationship and teaching styles in primary education: A model of analysis. *Journal of Professional Capital and Community*, *8*(3), 165-183. https://doi.org/10.1108/JPCC-09-2022-0053

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Palo Alto, CA: Learning Policy Institute.

Deal, T. E., & Peterson, K. D. (2016). *Shaping school culture*. Hoboken, NJ: John Wiley & Sons.

Dong, P., & Rhene, C. T. (2024). Assessing the impact of university teachers' digital leadership on enhancing student learning effectiveness. *International Journal of Education and Humanities*, *16*(3), 299-304. https://doi.org/10.54097/r5kxmh38

Dul, V., Sam, R., Hak, S., Vy, S., & Kheuy, S. (2024). Servant leadership style in higher education institutions: A systematic literature review. *European Journal of Contemporary Education and E-Learning*, *2*(6), 116-139. https://doi.org/10.59324/ejceel.2024.2(6).08

Fu, C., Zhao, Z., Wang, H., Ouyang, M., Mao, X., Cai, X., & Tan, X. (2022). How perceived school culture relates to work engagement among primary and secondary school teachers? Roles of affective empathy and job tenure. *Frontiers in Psychology*, *13*, 878894. https://doi.org/10.3389/fpsyg.2022.878894

Fuller, F. F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal*, *6*(2), 207-226. https://doi.org/10.3102/00028312006002207

George, A. A., Hall, G. E., Stiegelbauer, S. M., & Litke, B. (2008). *Stages of concern questionnaire*. Austin, TX: Southwest Educational Development Laboratory.

Guoba, A., Žygaitienė, B., & Kepalienė, I. (2022). Factors influencing teachers' job satisfaction. *Journal of Humanities and Social Sciences Studies*, *4*(4), 234-241. https://doi.org/10.32996/jhsss.2022.4.4.30

Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2022). *Multivariate data analysis* (9th ed.). Boston, MA: Cengage Learning.

Hall, G. E. (1985). A stages of concern approach to teacher preparation. Research and Development Center for Teacher Education, The University of Texas at Austin. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process*. Albany, NY: Suny Press.

Hargreaves, A. (2001). *Changing teachers, changing times*. London, UK: Bloomsbury Publishing.

Harini, N. D., Suyahmo, S., & Handoyo, E. (2018). Work Ethic of Social Studies Teachers in the Implementation of Local Cultural Excellence of Tegal. *Journal of Educational Social Studies*, *7*(2), 177-184.

Hill, H. C., Mancenido, Z., & Loeb, S. (2021). *Effectiveness research for teacher education*. Ed Working Paper No. 20-252. Annenberg Institute for School Reform at Brown University.

Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial intelligence for assessment and feedback to enhance student success in higher education. *Mathematical Problems in Engineering*, *2022*(1), 5215722. https://doi.org/10.1155/2022/5215722

Jing, M., Guo, Z., Wu, X., Yang, Z., & Wang, X. (2025). Higher education digital academic leadership: Perceptions and practices from Chinese university leaders. *Education Sciences*, *15*(5), 606. https://doi.org/10.3390/educsci15050606

Kline, R. B. (2023). *Principles and practice of structural equation modeling* (5th ed.). New York: Guilford publications.

Kock, N. (2020). Harman's single factor test in PLS-SEM: Checking for common method bias. *Data Analysis Perspectives Journal*, *2*(2), 1-6.

Kraft, M. A., & Papay, J. P. (2014). Can professional environments in schools promote teacher development? Explaining heterogeneity in returns to teaching experience. *Educational Evaluation and Policy Analysis*, *36*(4), 476-500. https://doi.org/10.3102/0162373713519496

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*(3), 607-610. https://doi.org/10.1177/001316447003000308

Leithwood, K., & Jantzi, D. (2005). Transformational leadership. In B. Davies (Ed.), The essentials of school leadership. In (pp. 31–43). London, UK: SAGE Publications.

Leithwood, K., Sun, J., & Pollock, K. (2017). *How school leaders contribute to student success: The four paths framework* (Vol. 23). Dordrecht, Netherlands: Springer.

Liu, X. (2024). Effect of teacher–student relationship on academic engagement: The mediating roles of perceived social support and academic pressure. *Frontiers in Psychology, 15*, 1331667. https://doi.org/10.3389/fpsyg.2024.1331667

Martin, F., & Xie, K. (2022). *Digital transformation in higher education: 7 areas for enhancing digital learning. Educause Review*. Louisville, CO: EDUCAUSE.

Meng, S. (2023). Enhancing teaching and learning: Aligning instructional practices with education quality standards. *Research and Advances in Education, 2*(7), 17-31. https://doi.org/10.56397/RAE.2023.07.04

Perreira, T., Berta, W., Ginsburg, L., Barnsley, J., & Herbert, M. (2018). Insights into nurses' work: Exploring relationships among work attitudes and work-related behaviors. *Health Care Management Review, 43*(4), 315-327.

Pickett, L., & Fraser, B. (2010). Creating and assessing positive classroom learning environments. *Childhood Education, 86*(5), 321-326. https://doi.org/10.1080/00094056.2010.10521418

Podsakoff, P. M., Podsakoff, N. P., Williams, L. J., Huang, C., & Yang, J. (2024). Common method bias: It's bad, it's complex, it's widespread, and it's not easy to fix. *Annual Review of Organizational Psychology and Organizational Behavior, 11*(1), 17-61. https://doi.org/10.1146/annurev-orgpsych-110721-040030

Qureshi, N. (2016). *Professional development of teacher educators: Challenges and opportunities*. Coventry, UK: University of Warwick.

Rahiman, M. H. U., & Kodikal, R. (2017). Impact of employee work related attitudes on job performance. *British Journal of Economics, Finance and Management Sciences, 13*(2), 93-105.

Ramaila, S., & Molwele, A. J. (2022). The role of technology integration in the development of 21st century skills and competencies in life sciences teaching and learning. *International Journal of Higher Education, 11*(5), 9-17. https://doi.org/10.5430/ijhe.v11n5p9

Sabharwal, R., & Miah, S. J. (2024). Evaluating teachers' effectiveness in classrooms: An ML-based assessment portfolio. *Social Network Analysis and Mining, 14*(1), 28. https://doi.org/10.1007/s13278-023-01195-5

Sagor, R. D. (1996). *Local control and accountability: How to get it, keep it, and improve school performance*. Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools.

Said, S. M., Sharif, S., & Abdullah, M. K. J. (2023). Unveiling the excellent leadership qualities and practices of principals in Islamic schools: A systematic literature review. *International Journal of Learning, Teaching and Educational Research, 22*(9), 43-61. https://doi.org/10.26803/ijlter.22.9.3

Salina, J. H. (2023). Humanizing the culture of technology teams: Strategies for creating healthier and more productive work environments. *Journal of Software Engineering and Applications, 16*(12), 641-671. https://doi.org/10.4236/jsea.2023.1612033

Salmerón, R., García, C., & García, J. (2020). Overcoming the inconsistences of the variance inflation factor: A redefined VIF and a test to detect statistical troubling multicollinearity. *arXiv preprint arXiv:2005.02245*. https://doi.org/10.48550/arXiv.2005.02245

Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling* (2nd ed.). Mahwah, NJ: Psychology Press.

Shu, K. (2022). Teachers' commitment and self-efficacy as predictors of work engagement and well-being. *Frontiers in Psychology, 13*, 850204. https://doi.org/10.3389/fpsyg.2022.850204

Siswadhi, F., & Rony, Z. T. (2024). The role of transactional leadership in organisational adaptation to digitalisation: Systematic literature review. *East Asian Journal of Multidisciplinary Research, 3*(2), 721-732. https://doi.org/10.55927/eajmr.v3i2.7775

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783-805. https://doi.org/10.1016/S0742-051X(01)00036-1

Türk, A. (2023). Digital leadership role in developing business strategy suitable for digital transformation. *Frontiers in Psychology, 13*, 1066180. https://doi.org/10.3389/fpsyg.2022.1066180

Wang, C. (2022). Analysis on the differences between private schools in China and in Western countries. Master's Thesis. Beijing Normal University, Beijing, China.

Wu, J. (2023). Nurturing teaching talent: A focus on young faculty professional development in private colleges and universities of China. *Frontiers in Educational Research*, *6*(19), 42–50. https://doi.org/10.25236/FER.2023.061908

Yu, X. (2025). The strategies and effects of re-branding private universities in China: A comparative study of three private universities. *Lecture Notes in Education Psychology and Public Media*, *76*, 202-210. https://doi.org/10.54254/2753-7048/2024.20420

Zhu, X., & Tabajen, R. C. (2024). Exploring the link between transformational leadership and teacher innovation. *International Journal of Education and Humanities*, *16*(3), 83-87. https://doi.org/10.54097/a6660y88