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Research Article

The Impact of President Digital Leadership on Lecturer Technology Usage: The Mediating Role of Lecturer Digital Competence

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ABSTRACT

Information Industry Revolution 4.0 brings opportunities and challenges for university. In the context of educational digital transformation, the requirement for presidents and lecturers have changed. In response to the need for university presidents to foster and upskill lecturers digital competence and technology usage, this study examined the direct impact of president digital leadership on lecturer technology usage, and also examine how lecturer digital competence mediates this relationship in Jilin Province, China, analyzing by using structural equation modeling through SmartPLS 4.0 software. Findings reveal that president digital leadership has a moderate direct effect on lecturer technology usage. Meanwhile, lecturer digital competence do act as a mediating role on this relationship. However, not all the dimensions of lecturer digital competence mediating the relationship. The study implicates that with ongoing training to improve lecturer digital competence, universities will cope with the complex challenges brought by the digital age and could better enable universities to promote digital transformation.

Keywords: Digital Leadership, Digital Competence, Technology Usage, Structural Equation Model, Higher Education

1. INTRODUCTION

The increasing modern technologies have provided high-quality educational opportunities, build inclusive, open, and resilient learning systems, and transform the way of teaching and learning for educators and students (UNESCO, 2022). Therefore, digital transformation of education has become a popular trend in the whole world (Berkovich & Hassan, 2023). The global demands of digital transformation have incited growing interest in exploring the potential roles of lecturer digital behavior. To improve lecturer digital behavior, Ministry of Education in China proposed the Education Informatization Action 2.0 policy in 2018, which calls for comprehensive improvement of lecturer digital competence and technology usage (MOE,2018). After several years of efforts, the report on the Development of Informatization in China's Higher Education (2023) documented that 73.9% of universities across the country provided lecturers with training in basic computer skills. However, lecturer digital competence and lecturer technology usage remains a problem (Krassadaki et al., 2022). Given this reliability, it is necessary to improve lecturer digital competence and lecturer technology usage.

Up to now, technologies play a crucial role in education. Although countries have invested huge amounts of money to ensure lecturers have access to digital technologies, if they do not use the devices, the investment will be in vain. A growing body of literature has shown that lecturer technology usage will enhance teaching, learning and research outcomes (Islam et al., 2019). In light of these significant potential outcomes, examining the factors that influence lecturer technology usage is crucial for universities to run smoothly in digital age . Numerous studies have reported that factors including professional development opportunities, perceived utility of technology, institutional support, lecturer digital competence and leadership (Amhag et al., 2019) have a big impact on lecturer technology usage (Perienen, 2020).

President digital leadership facilitates the digital transformation of universities and promoting lecturer technology usage (AlAjmi, 2022).The role of university presidents extends beyond merely setting a vision; they are responsible for creating an ecosystem that supports and encourages digital innovation

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(Antonopoulou et al., 2020). Presidents are at the core of the university administration, has a direct impact on lecturers attitudes and behavior towards educational technology (Ehlers & Studies, 2020). However, the impact of president digital leadership on lecturer technology usage is still mixed. Some findings from previous studies hold the view that president digital leadership impacted lecturer technology usage positively (Purnomo et al., 2023), while the other findings reveal that there is a moderate relationship (Raman et al., 2019). Therefore, we can assume that there may be mediating variables underlying the effect of president digital leadership on lecturer technology usage. Which means, how president digital leadership affects lecturer technology usage, and the mechanism of its action are unclear. In addition, the amount of research on this relationship in Chinese context is relatively small, therefore, a deficit in the corpus of knowledge in this area (Craglia et al., 2012).

Moreover, although the president digital leadership for technology usage is relevant, it is not determinant of technology usage (Antonietti et al., 2022). The role of president digital leadership on lecturer technology usage still has a missing link (Shin et al., 2023). Previous research has proven that integrating lecturer digital competence into the relationship between president digital leadership and lecturer technology usage can better explain how president digital leadership affects lecturer technology usage (Gudmundsdottir & Hatlevik, 2018). Given this reality, in-depth research to the lecturer digital competence is needed. Because the lack of lecturer digital competence is also a big obstacle for the development of lecturer professional development (Fernández-Batanero et al., 2022).

Despite the increasing attention on president digital leadership, lecturer digital competence and technology usage, there are less research related all the three main variables in one empirical research. In specifically, there is few research examine the mediating effect of lecturer digital competence on the relationship between president digital leadership and lecturer technology usage. Furthermore, how lecturer digital competence act as mediating role in details is unknown. Therefore, it is needed to explore the mediating effect of various dimensions from lecturer digital competence can provide more targeted recommendations for improving teachers' digital competence and technology use.

Furthermore, differences in economic development between different provinces in China led to the digital transformation of education being at different stages(Iivari et al., 2020). This study will be conducted in Jilin Province, whose economy is relatively lagging behind that of southern cities. Therefore, to promote the improvement of the level of digital transformation in Jilin Province, this study takes the lecturers of Jilin universities as the unit of analysis, deeply analyze the role of digital leadership in shaping the lecturer technology usage by the mediating effect of digital competence. On this account, the objective of the study are as follows:

RO1.To determine the direct effect of president digital leadership on lecturer technology usage.
RO2.To determine whether lecturer digital competence mediates the relationship between president digital leadership and lecturer technology usage.
RO3.To determine which dimension of lecturer digital competence contributes to the mediating effect.

The following part begins with a deep literature review about the president digital leadership, lecturer technology usage and lecturer digital competence, while followed by hypothesis. Next, a rigorous study design was proposed with sampling, instrument, data collection and analysis. Subsequently, the findings from the results and discussion based on the research objectives are presented. The research end with the implication, limitation and conclusion.

2. Literature Review

2.1. Digital leadership

An understanding of the definition of digital leadership is the foundation for looking deep into digital leadership field. Therefore, for several decades, scholars have made various definitions. Some scholars consider digital leadership as an ability to utilize digital technology to manage school, while others consider digital leadership as a combination of transformational leadership and technology adopted (Mihardjo et al., 2019). However, from the various definition of leadership, digital leadership should be defined as an ongoing process of interaction with followers and motivating them in order to achieve goals. In sum, the main components defining digital leadership include: have ability, motivate and influence the followers, set goals, interactive process, technology. These were in line with the five dimensions of International Society of Technology in Education for Administrators (ISTE, 2018), namely: equity and citizen advocate, visionary planner, empowering leader, systems designer and connected learner. However, technological updates, organizational developments and environmental changes result in digital leadership being a complex dynamic variable and therefore the definition of digital leadership should evolve dynamically. Therefore, digital leadership in this study is defined as a gradual evolutionary process to face the changing digital social environment. The process involves the gradual development of lecturers' attitudes, perceptions, and competence in digital domain in order to guide the lecturers in enhancing their digital attitudes, digital perceptions, and digital competence.

2.2. Lecturer Technology Usage

Previous studies noted that lecturer technology usage can not only benefit their teaching-learning process but also benefit student academic and school outcomes (Akram et al., 2022). It is a core component of the lecturers' education ability. However, the level of lecturer technology usage is not up to the expectation. A growing body of studies have been conducted to analyze which factors are influencing or constraining the lecturer's technology usage. The factors are divided into internal factors and external factors. Regard to the external factor, it is said that lecturer readiness to use technology is strongly dependent on school readiness (Petko et al., 2018). School readiness encompasses infrastructure, professional development opportunities, and leadership. President is an important external factor, since president has a significant impact on lecturers' behavior. Ugur and Koç (2019) see that encouraging the technology usage in class is a major challenge for the university president. The digital leader, should aware the importance of technology usage in education, and insure technology integration in their schools (A'mar & Eleyan, 2022). In addition, a majority of the literature implies that a key step in increasing lecture technology usage may be changing their internal factors. As the internal factor, high level of digital competence can contribute to a more critical and frequent technology usage (Redecker & Punie, 2017).

Moreover, the influencing factors of lecturer technology usage are multiple. The smooth implementation of lecturer technology usage is not dependent on or absence of only one individual influencing factor (Sunal et al., 2009). These influencing factors are interrelated. In addition, since different countries' contexts are different in population, culture background and economic development, the main influencing factors may be different. In regard of this, research on the influencing factors of Chinese lecturers' technology usage of universities should be carried out within the specific national context.

2.3. Lecturer Technology Competence

Since the development of modern technology, more and more attention has been paid to the lecturer's digital competence in higher education. For decades, various definition of digital competence have been made. Generally, competence refers to that individual or organization have the ability to accomplish a specific task. In educational settings, lecturers are the directors of students' learning and growth, their digital competence directly affects the teaching quality and students' learning outcome (Pettersson, 2018).The lecturers have to enhance their knowledge and skills in order to use technology tools more effectively. Therefore, lecturer digital competence in current study is defined as the ability to perform technology-enabled activities to the occupational standard expected for lecturer using technology in the education context, including improve digital environment, knowledge deepen, knowledge creation, foster technology awareness and help students to use technology in the same way, which with five dimensions, namely: smart pedagogy, digital age learning experiences and assessments, digital age work and learning, digital citizenship and responsibility and professional growth and leadership (ISTE, 2008) .

Previous studies have suggested that organizations, especially the top management support can promote the development of lecturer digital competence by supporting and creating the environment (Rachmadtullah et al., 2020). Meanwhile, as Suárez-Rodríguez et al. (2018) noted, digital competence can predict technology usage. Therefore, the current study takes lecturer digital competence as a mediate variable, according to the discussion above, the three hypotheses was proposed:

H1. President digital leadership has a positive direct effect on lecturer technology usage.

H2. Lecturer digital competence mediates the relationship between president digital leadership and lecturer digital competence.

H3. All the dimensions of lecturer digital competence mediate the relationship between president digital leadership and lecturer digital competence.

3. METHOD

3.1 Research Design

For the current study, a quantitative research design was adopted to quantify the relationship between president digital leadership and lecturer technology usage, along with the mediating effect of lecturer digital competence. Meanwhile, the study adopted a cross-sectional survey to gather data through online questionnaires in the location of Jilin Province, China

3.2. Population and sampling

The target population of this study is all the 25912 lecturers from total 25 universities in Jilin Province. The appropriate sample size, not too small or too large, have the able to address the research objectives. The current research adopted the G*Power to calculate the minimum sample size, which is recommended for sample size (Kang, 2021), and usually used in social research for statistical tests (Erdfelder et al., 1996). In this analysis, the G*Power software was employed to conduct the F test of regression. Multiple regression with 2 variables is used in this Power analysis to get an accurate sample size, which is 107. Meanwhile, it has

been observed in prior research that when the sample size is increased, the parameter estimates tend to converge towards the so-called "true" parameter values. (Hui & Wold, 1982). Furthermore, for quantitative research, the sample size is acceptable from a range of 30 to 500 (Roscoe, 1975). Therefore, take respondents rate into account, also to make the sample more representative, this study determined the sample size to be 500 lecturers. Then use random sampling to select participants. By distributing the online questionnaires links to the sample, 442 valid questionnaires were completed and returned, which show a response rate of 88%.

The respondent demography was shown in Table 1. the respondents of males (56.1%) is more than females (43.9%) . The age between 31-40 dominates the most (44.8%), followed by the age between 41-50 (31.4%). Only 5.7% are the age above 50. Meanwhile, 49.1% majored in social sciences and humanities while 50.9% majored in natural sciences and technology. In addition, there are experience in using computer between 5-10 years dominates the most, which is 38.5%.

Table 1 Respondent Demography

Demographic	Category	Frequency	Valid(%)
Gender	Male	248	56.1
	Female	194	43.9
Age	20-30	80	18.1
	31-40	198	44.8
	41-50	139	31.4
	Above 50	25	5.7
Academic discipline	Social Sciences and Humanities	217	49.1
	Natural Sciences and Technology	225	50.9
Experience in using computer	Below 5	84	19
	5-10	170	38.5
	11-15	142	32.1
	16-20	34	7.7
	Above 20	12	2.7

3.3. Instruments

The current study contains three main variables, therefore, there are three instruments for these variables.

They are president digital leadership (PDL) sub-scale, lecturer digital competence (LDC) sub-scale and lecturer technology usage (LTU). All the instruments are 5-point Likert scale.The instruments are all from existing scales that have been developed an used in previous studies.

The instrument of president digital leadership was revised from ISTE-A (2018) to measure president digital leadership with 23 items.

The instrument of lecturer digital competence was revised from ISTE-T (2008) to measure teacher digital competence with 27 items from five dimensions.

The instrument of LTU was adopted from the types of teachers' activities with technology designed by Chilean Ministry of Education which has 18 items. Meanwhile, in order to ensure the lecturers can understand the items easily, the current study adopted back-translation method to deal with language issues.

3.4. Data analysis procedure

PLS-SEM though SmartPLS 4.0 is adopted to analyze the data. Partial least squares (PLS) are a statistical technique that was known as Structural Equation Modeling (SEM), has proven to be a useful and flexible tool for statistical modeling, which has several advantages.

Different from maximum likelihood-based (CE-SEM) or multiple regression analysis method, which require normally distributed data, while PLS-SEM makes no distributional assumption (Hair Jr et al., 2021).

Meanwhile,by PLS-SEM, researchers can examine the relationships between different variables simultaneously and can build complex models that include both observed and latent variables, leading to a more comprehensive understanding of the inner structure of the research object.

As shown in Figure 1, is the reflective second order hierarchical model drawn by SmartPLS 4.0 software.

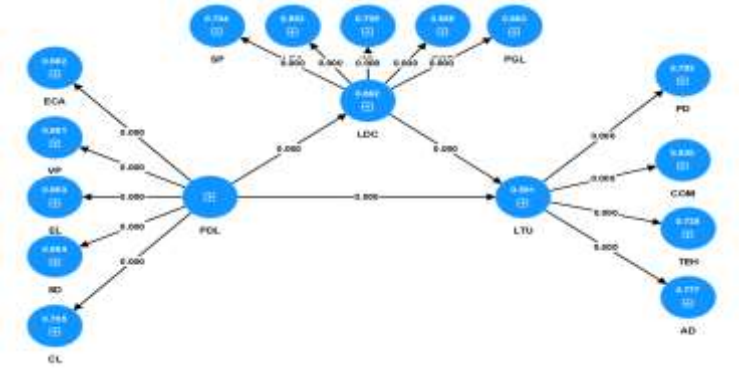

Figure 1: The reflective second order hierarchical model

4. RESULTS

4.1. Assessment of measurement model

4.1.1. Indicator reliability

Indicator reliability was performed to evaluate what extent a set of indicators was consistent to measure with (Urbach & Ahlemann, 2010). The factor loading of this study ranges from 0.778 to 0.861, which are reached the standard 0.708, which means this study has a good indicator reliability. The higher factor loading value contributes more to the average variance extracted (AVE).

4.1.2 Internal consistency

Internal consistency is one of the important indicators to test the stability and consistency of the instruments, which is commonly measured by composite reliability (CR) and Cronbach's Alpha (CA) (Heo et al., 2015). The value of CR are above 0.8 or 0.9 means high consistency reliability. As shown in Table 2, both CR and CA are greater than 0.8. These results showed a good internal consistency of the items.

Table 2: Reliability and Validity Analysis for Measurement Model

Constructs	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
President digital leadership	0.899	0.943	0.804
Lecturer digital competence	0.913	0.941	0.797
Lecturer technology usage	0.882	0.901	0.769

4.1.3 Convergent validity

Convergent validity refers to the degree to which different indicators reflect the underlying construct in comparison with other indicators (Urbach & Ahlemann, 2010), which commonly method by Average Variance Extracted (AVE) and Composite Reliability(CR). When AVE value exceeds 0.5, it indicates sufficient convergent validity for the whole construct (Hair et al., 2017). Table 2 presents the AVE and CR , AVE value ranges from 0.769 to 0.804, while CR value are all greater than 0.8, both met the recommended standard. This outcome suggests that the instruments used in this study demonstrates sufficient convergent validity.

4.1.4 Discriminant Validity

Discriminant Validity is the degree of variability between different constructs in a measurement tool, the degree to which it is used to distinguish between different concepts, which was measured by HTMT (Hair et al., 2017). As shown in the Table 3, the HTMT value from 0.751 to 0.862. This result was satisfied by using the HTMT value of 0.90 (Gold et al., 2001). This indicates that the concepts in the model are well differentiated.

Table 3: HTMT Discriminant Analysis for Measurement Model

Constructs	PDL	LDC	LTU
President digital leadership	1.00		
Lecturer digital competence	0.862	1.00	
Lecturer technology usage	0.751	0.817	1.00

4.2. Assessment of structural model

4.2.1. Collinearity Analysis

Avoiding collinearity issues between the construct in the model is a crucial step. When collinearity is high, it increases the standard error and reduces the predictive competence of the model (Dormann et al., 2013).

Generally, the collinearity is measured by VIF value. As suggested by Hair et al. (2011), below the threshold value 5 is accepted. In the current study, VIF values for the variables were 1.000 and 2.962. Therefore, the current study has no collinearity issues.

Table 4: VIF Values

	President digital leadership	Lecturer digital competence	Lecturer technology usage
President digital leadership	-		
Lecturer digital competence	1.000	-	
Lecturer technology usage	2.962	2.962	-

4.2.2. The coefficient of determination (R^2)

The main function of R^2 value is to measure the prediction accuracy of the model. The R^2 value ranges from 0 to 1, with larger values indicating higher prediction accuracy. According to (Chin, 1998), the value of 0.67, 0.33 and 0.19 represents the high, medium and low level prediction accuracy. The R^2 values for this study were obtained through the PLS algorithmic program and are presented in Table 5. According to the result of R^2 Value for for Lecturer technology usage is 0.591, represented that the lecturer technology usage accounts for 59.1 percent of the variance in the observation.

Table 5: R^2 Value

Construct	R^2	Result
Lecturer technology usage	0.591	Moderate

4.2.3. Assessment of the effect size (f^2)

The main function of f2 value is to determine whether the omitted construct has substantive effects on the endogenous constructs. Noted by Cohen (1988), the values of 0.02, 0.15, and 0.35 correspond to weak, moderate, and strong effect sizes. Table 7 represented the effect size (f2) of the exogenous construct for this research. The path between president digital leadership and lecturer digital competence is strong effect, the path between lecturer digital competence and lecturer technology usage is weak effect, the path between president digital leadership and lecturer technology usage is moderate effect.

Table 7: f^2 Effect Size

Path	f^2	Effect size
PDL --> LDC	0.665	Strong effect
LDC --> LTU	0.286	Moderate effect
PDL-->LDC--> LTU	0.044	Weak effect

Note: N=442; PDL=President digital leadership; LDC=Lecturer digital competence; LTU=Lecturer technology usage

4.2.4. Assessment of the predictive relevance(Q^2)

The main function of Q^2 value is to represented a measurement of how well the path model can predict the original observed value that is conducted using the blindfolding approach (Hair et al., 2017) which can be performed by employing the "Blindfolding" process. The Q^2 value of 0.02, 0.15, and 0.35 correspond to weak, moderate, and strong effect sizes (Hair et al., 2011). The result of this assessment gets viewed in the Table 8, the predictive relevance Q^2 values for lecturer digital competence and lecturer technology usage are 0.523 and 0.450. That indicated that the model has a good predictive relevance.

Table 8: Q^2 value

Endogenous Construct	Q^2	Effect size
Lecturer Digital Competence	0.523	Strong effect
Lecturer Technology Usage	0.450	Strong effect

4.3. Hypotheses Testing

4.3.1 H1. President digital leadership has a positive direct effect on lecturer technology usage.

The current study hypothesized the direct effect of president digital leadership on lecturer technology usage. Bootstrapping technique was adopted to test hypothesis. As shown in Table 9, the Path Coefficient value of direct effect (0.231) between president digital leadership and lecturer technology usage was significant (t=3.774, p-value=0.000). Therefore, the result confirm that president digital leadership has a positive direct effect on lecturer technology usage.

Table 9 Path Coefficients, Observed T-Statistics, and P-value for the mediating effect of LDC between PDL and LTC

Hypothesized paths	Path Coefficients	Observed T-Statistics	P-value
PDL-->LTU (direct effect)	0.231	3.774	0.00
PDL-->LDC-->LTU (Indirect effect)	0.463	9.988	0.00
PDL-->LTU (Total effect)	0.694	24.461	0.00

Note: N=442;PDL=President digital leadership; LDC=Lecturer digital competence; LTU=Lecturer technology usage

4.3.2 H2. Lecturer digital competence mediates the relationship between president digital leadership and lecturer digital competence.

The current study also hypothesized the mediating effect of lecturer digital competence in the relationship between president digital leadership and lecturer technology usage in universities of Jilin Province,China. According to the results shown in the Table 9, the indirect path (PDL-->LDC-->LTU) was measured as 0.463 and with the Observed T-Statistics is 9.988, p-value is 0.000. which means the path is significant. Moreover, total effect from president digital leadership to lecturer technology usage is 0.694, with the t-statistics value is 24.461, p-value is 0.00. The indirect effect from mediating variable is higher than the direct effect from president digital leadership to lecturer technology usage. Therefore, the result confirm that Lecturer digital competence plays a mediating role on the relationship between president digital leadership and lecturer digital competence.

4.3.3 H3. All the dimensions of lecturer digital competence mediate the relationship between president digital leadership and lecturer digital competence.

The individual dimensions of LDC as mediating variable were also examined by PLS-SEM, the results were shown in Figure 2 and Table10. The path coefficients of the five dimensions ranged from -0.033 to 0.376. Not all the dimensions in the lecturer digital competence have mediating effect. From the results, it seems Professional growth and leadership (β=0.376, t value=6.090, p=0.000) contributes most, and followed by Digital citizen and responsibility (β=0.282, t value=4.084, p=0.000). However, only these two dimensions contribute to the mediating effect, while the other three dimensions do not significantly mediating the relationship between president digital leadership and lecturer technology usage. Therefore, the result rejected that All the dimensions of lecturer digital competence mediate the relationship between president digital leadership and lecturer digital competence.

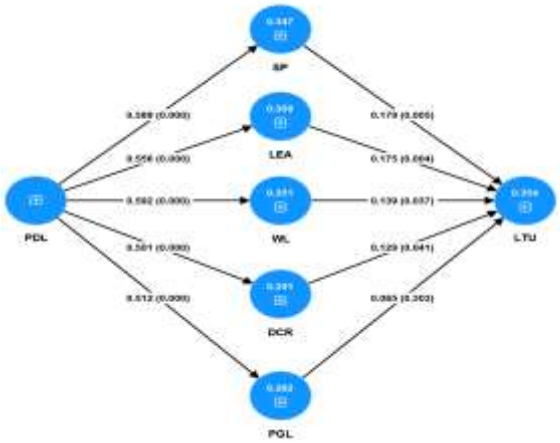

Figure 2. Structure Models of dimensions from LDC

Table 10. Path Coefficients, Observed T-Statistics, and P-value for the relationship between dimensions from LDC

Path	Path Coefficients	Observed T-Statistics	P-value
PDL-->Smart Pedagogy-->LTU	-0.033	1.179	0.239
PDL-->Digital age learning experiences and assessments-->LTU	0.099	1.803	0.071
PDL-->Digital age working and learning-->LTU	-0.041	1.360	0.174
PDL-->Digital citizen and responsibility-->LTU	0.376	6.090	0.000
PDL-->Professional growth and leadership-->LTU	0.282	4.084	0.000

Note: N=442;PDL=President digital leadership; LDC=Lecturer digital competence; LTU=Lecturer technology usage

5. DISCUSSION

The first objective of this study was to determine the direct effect of president digital leadership on lecturer technology usage. The second objective is to determine the mediating effect of lecturer digital competence on this relationship. The last objective is to determine which dimension of lecturer digital competence contributes more to the mediating effect.

According to the result, president digital leadership do have a positive direct effect on lecturer technology usage. As previous study have reported that digital leadership is a functional leadership that is characterized from transformational leadership (Hamzah et al., 2021), which influence lecturer behavior by encouraging and inspiring them toward the goal set by leaders. This findings were similar to the empirical research conducted by Ismail et al. (2021) that the positive correlation between technology leadership and teacher technology usage is moderate. This was in line with a current study, Alexandro and Basrowi (2024) indicated that president digital leadership has a significant positive relationship with lecturer adopted learning management system.

Meanwhile, the result displays that there is a partial mediation role of digital competence between digital leadership and lecturer technology usage, which supported Hypothesis 2. This was in line with Petko et al. (2018), conclusions from an empirical study showed that in order to promote technology usage, both school support and lecturer individual belief of ICT should be take into account. Moreover, their study further showed that top management support has a strong impact on teacher individual belief of ICT, then has a moderate impact on teacher behavior. The results of the current study proved that the process of integrating digital technology is a complex process, both contextual and lecturer-related personal factors should be considered (Almerich et al., 2016).

The reason why lecturer digital competence mediated the effect of president digital leadership on lecturer technology usage is that the practice of president digital leadership introduced a more comprehensive and systematic training and development program focused on enhancing the digital competencies of lecturers (Jogezai et al., 2023; Jorge-Vázquez et al., 2021). Through digital competence, lecturers are able to use new technologies more flexibly and proficiently, thus leading to a wider use of technology (Kubrushko et al., 2020). That is to say, president digital leadership provides an opportunity to provide support and drive change, and lecturer digital competence is a key medium for translating this opportunity into practical action.

In order to look deep into the mediating effect, further PLS-SEM analysis of each dimension from the lecturer digital competence was implemented. From the results, it seems Digital citizen and responsibility (β=0.376, t value=6.090, p=0.000) contributes most, which means presidents should pay more attention to knowledge and skills of smart pedagogy, so that the lecturers will improve their technology usage for safe and responsible technology usage. And then followed by Professional growth and leadership (β=0.282, t value=4.084, p=0.000) , presidents should provide resources and opportunities to provide ongoing training for lecturers to improve digital competence. This helps lecturers to better meet the challenges of modern educational technologies and methods.

In fact, the relationship between president digital leadership and lecturer technology usage is complex, except for the digital competence as mediating variable, there may be other mediating variables should be examined. Moreover, this also explained the difference between lecturer digital competence and lecturer technology usage. In the current study, the lecturer digital competence is examined by self-reported, this self-report questionnaire, rather than effectively measuring lecturers' digital leadership, measured lecturers' perceptions of their own digital competence, as Bandura (1986) noted that beliefs are more predictive of future behavior than actual levels of knowledge and skill. Therefore, self-efficiency is not the actual use of technology, and their relationship also needs to take into account the impact of digital infrastructure , university culture, and lecturer commitment.

6. IMPLICATION

At the theoretical level, the results of this study contribute to enriching and refining the body of knowledge on the integration of educational leadership and the educational technology. In the context of Chinese universities, the study validates the theoretical association of president digital leadership on lecture' technology usage. In addition, although existing studies have constructed models of how digital leadership affects lecturers' technology use, this study complements and refines the existing models by adding lecturers' digital competence as a mediating variable. On the one hand, this study delves into the relationship between digital leadership and technology usage. On the other hand, this study divided lecturer digital competence into different dimensions to explore its effect as a mediating variable. This not only emphasizes the importance of digital competence, but also enhances the accuracy of the model.

In addition, the findings of this study have important relevance and guidance value for university management practices, especially for university presidents and policy makers. Specifically, the findings emphasize the urgency of enhancing lecturer' digital competence. Therefore, in order to maximize the impact of digital leadership, policymakers and president should commit to improving lecturers' digital competence through training and support activities. In addition, this study provides empirical evidence that university presidents need to be equipped with digital leadership in order to effectively manage their universities in the digital age and meet the demands of the digital transformation of education.

7. CONCLUSION

In sum, this current study improves the knowledge of how digital leadership affect lecturer technology usage in public universities. This study also validated the mediating role of lecturers' digital competence between president digital leadership and lecturer technology usage. This finding not only theoretically strengthens the relationship between digital leadership and technology usage, but also provides strong guidance for practical educational management and training, emphasizing the importance of digital competence and highlighting its mediating role in digital transformation. This provides practical and actionable insights and recommendations for school administrators and policy makers in promoting digital education.

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