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ORGANIZATIONAL ENVIRONMENT AND TECHNOLOGICAL SUPPORT THROUGH TEACHERS' SELF-EFFICACY IMPACT ON TEACHER'S TPACK LEVEL EFFECTIVENESS

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Abstract
In the era of educational information 2.0, the role of information technology in education and teaching is becoming more and more prominent. how to improve their professional level in order to adapt to this information age has become a common concern of teachers. Technological Pedagogical Content Knowledge(TPACK) provides a new perspective for teachers' professional development and professional level improvement. In recent years, scholars all over the world have carried out a lot of research work in this field. With the gradual deepening of research, more and more scholars have found that TPACK is a kind of new knowledge involving many conditions and factors, and teachers' mastery and application of this kind of knowledge often have to cooperate with many external factors such as society, culture and psychology. Therefore, how to define the influencing factors of TPACK will become an important breakthrough in this field in the future. The purpose of this study is to explore Organizational Environmental and Technological Support through Teachers' self-efficacy (TSE) impact on Teacher's TPACK level effectiveness. In this study, a questionnaire survey was conducted among 400 primary school teachers in Sanmenxia City, Henan Province, and the collected data were statistically analyzed by SPSS and AMOS software. on the basis of exploratory factor analysis, structural equation model and path analysis were used to test the research hypothesis. In this study, it is found that Organizational Environmental and Technological Support have a significant impact on the promotion of Teachers' self-efficacy, and Teachers' self-efficacy plays a mediating role among Organizational Environment, Technological Support and Teachers' TPACK Level Effectiveness. On the theoretical level, the research results of this study further enrich and develop the theoretical framework of TPACK, which is an important part of the subject-based theory of teacher educational technology system. On the practical level, it will be possible to promote the reform of the traditional way of training teachers' educational technology ability and promote the acquisition and effective transfer of teachers' educational technology ability.

Keywords: TPACK, Organizational Environmental, Technological Support, Teachers' self-efficacy (TSE)

1. Introduction

As one of the important driving forces of educational reform and innovation, how to integrate information technology into teaching effectively is a new problem that needs to be considered in education. In response to the call of educational informatization, schools actively build and develop infrastructure and environment conducive to the use of information technology. New educational models such as micro-class, flipped classroom and cloud education have also brought new vitality to education. As one of the direct users of technology, teachers should also keep up with the pace of the times, actively accept the changes brought about by information technology, and try to effectively integrate information technology into classroom teaching so as to improve teaching(Cai et al.,2022).Technological Pedagogical Content Knowledge(TPACK), which is a new form of knowledge produced by teachers when they integrate information technology, teaching methods and subject knowledge. it is a necessary professional knowledge for teachers under the informationisation of education. It puts forward the idea of using knowledge and technology in teaching with integrated thinking, and promotes people's thinking and practice on the relationship among technology, knowledge and teaching in instructional design and classroom teaching. It can help teachers to effectively use technology to teach knowledge, so as to promote students' learning. Nowadays, the improvement of Teachers' TPACK professional quality is one of the focuses in the field of education (Li,2023).

TPACK is a new knowledge point formed by the dynamic interaction and integration of Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK). It opens up a new direction for comprehensively improving teachers' professional literacy, strengthening teachers' professional skills and improving the level of information-based teaching. In order to fundamentally improve the current teachers' information application ability, it is necessary to strictly check the source and improve teachers' information technology ability. As a necessary new framework for teachers, TPACK knowledge framework will provide new thinking for teachers to improve their ability to integrate subject teaching knowledge and technology application, so as to resolve the barriers between disciplines, teaching and technology, form a correct understanding of information technology education, and meet the new standards and requirements for teachers' ability in the information age. The establishment of information-based teaching ability system based on TPACK framework can materialize the knowledge of teachers' information-based teaching application, and then provide favorable conditions for teachers to further master teaching knowledge and technical knowledge supported by information technology means, so that teachers can personally feel the key role of educational informatization in improving teaching quality (Zheng,2022).

Under the background of education information, teachers failing to integrate educational technology with subject knowledge and teaching knowledge, their career development will be more limited. In the past, when information technology was not common, teachers only needed to focus on understanding and studying the integration method of in-depth understanding of subject content and pedagogical knowledge. However, with the rapid development of information technology and its deep penetration into the education industry, teachers not only need to consider

the integration of subject knowledge and pedagogical knowledge, but also need to know how to choose appropriate technical knowledge to further integrate teaching content. So as to realize the innovation of teaching methods. If the teachers are insufficient in information teaching, or the overall technical level is not high enough, they can not adapt to the future teaching needs. TPACK itself is a knowledge framework with complex structure and loosely coupled elements. Teachers' learning, mastering and application of this kind of knowledge often need the cooperation of many factors. At present, the lack of consideration of external factors (context) has become a major obstacle to the further development of TPACK research (Xu, 2022). In the TPACK framework, context is a much more flexible and relaxed factor, and its understanding can be said to be kind and wise. At the beginning of its establishment, TPACK did not include contextual factors, but with the gradual deepening of research, more and more researchers have realized that TPACK is a kind of "ill-structured" new knowledge involving multi-conditions, multi-factors and interactions. Teachers' mastery and application of this kind of knowledge often need to cooperate with many external factors such as society, culture and psychology (Zhao&He, 2020). Therefore, Context is essential for the TPACK framework. If the context is not considered, TPACK will become a "castle in the air" and cannot be applied to specific teaching practice, that is, it has no practical guiding significance for specific teaching practice. The application of any kind of knowledge in TPACK in specific teaching activities, if it does not consider the physical characteristics of the classroom, the demographics of learners, psychology and other external factors, will become no practical value (Shi,2022).

To promote the improvement of teacher integration technology, China's Ministry of Education and local education administrative departments have issued a number of policies and systems. However, these policies and systems are often alienated and ineffective in the actual implementation of teachers. In the view of some teachers, technological innovation in accordance with the specific requirements advocated by policies and systems often means more teaching discontinuity, an increase in teaching emergencies, a loss of authority, a lack of ability, and a decline in self-efficacy. It is far less stable and controllable than older educational technologies. To avoid the embarrassment and frustration of unskilled new technology, they resist or even refuse to implement policies and institutions (Chen,2021). The technical support for teachers has not been truly diversified and effective. From the practical point of view, the technical support for teachers mainly focuses on the official unified technical training and the help of school professional technical personnel to teachers. Technical support methods such as teacher online education, mobile Internet terminal services, cloud services, virtual reality technology, and teacher personalized guidance relying on big data analysis are less popular. The related resources are few, lack of systematisation, and need to be expanded and developed urgently. Due to the lack of technical support, inefficiency has become a common problem for teachers to master technology. On the one hand, many online technical guidance lack incentive mechanism, teachers online learning is often more casual, learning continuity is not good, learning effect is difficult to guarantee. On the other hand, teachers are unable to effectively transform actual teaching needs into technical mastery, unable to comprehensively apply technology to solve practical teaching

problems according to the complexity of the situation, and rarely use the advantages of the network to optimize teaching methods and teaching content, resulting in a low TPACK level of teachers (Dong et al.,2020).

This study will further improve the theoretical model of TPACK and provide important reference for the training and application of TPACK for teachers. At present, the academic research on the factors affecting the effectiveness of teachers' TPACK level is limited to individual factors, such as self-efficacy, training courses (Li,2021), and there is no systematic study on the definition of the relationship between them and TPACK level. The research in this field may become an important breakthrough in the research on teachers' TPACK level effectiveness in the future. Research on the factors affecting the effectiveness of teachers' TPACK level will help to improve the universality of TPACK practice research conclusions and make the research results easier to popularize and apply (Wang,2022). As the basic research of future practical research, it may have broad research prospects.

2. Literature Review

The purpose of this study is to explore Organizational Environmental and Technological Support through Teachers' self-efficacy (TSE) impact on Teacher's TPACK level effectiveness. Through the analysis and collation of the relevant literature, this paper constructs the conceptual framework and puts forward the hypothesis of this study.

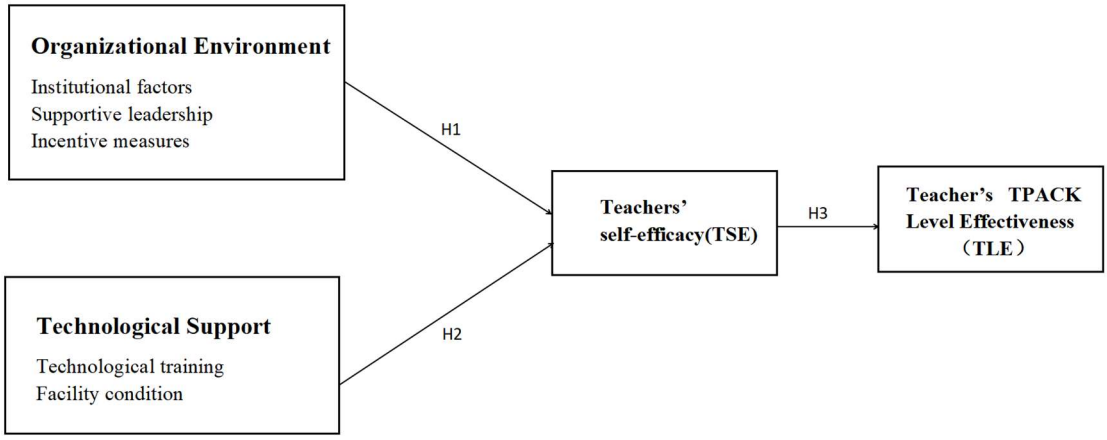

Figure 1 Conceptual Framework
Source: Developed by the Author

2.1 The impact of organizational environment on Teachers' self-efficacy

In 1992, American scholar Fessler put forward the theory of teacher career cycle and systematically studied and discussed the factors affecting teacher professional development (Fessler&Christensen,1992). He believes that the influential factors of teacher professional development mainly include organizational environment factors. The factors of organizational environment mainly include the organizational environment and school system. In the process of teacher professional development, the positive influence of organizational environment factors

will promote teacher professional development, while the organizational environment full of crisis will hinder teacher professional development. Teacher TPACK is one of the contents of teacher professional development. Learning from the research results in this field can provide guidance and theoretical basis for teachers' TPACK research. Xu (2014) used the teacher career cycle model to find that organizational factors are related to teachers' beliefs, motivation levels and self-efficacy. Most current studies on organizational factors and technology teaching knowledge are related to self-efficacy and technology teaching knowledge.

Zhang et al. (2023) investigated the effects of 982 school teachers' participation in professional learning communities on teachers' self-efficacy and job satisfaction in Shanghai. The results show that supportive leadership has a positive predictive effect on teachers' self-efficacy and job satisfaction, and organizational structure has a positive predictive effect on teachers' job satisfaction. Ma (2021) used Teacher Career Cycle Model in her research. She found that external factors related to individual teachers should be fully taken into account in future teacher TPACK research. These external factors include not only material factors, mainly social, community and school factors, but also personal factors, mainly school leaders and colleagues.

Çoban et al. (2023) examined the effects of principal trust and school leaders' focus on teaching on teacher self-efficacy. This study shows that the principal's trust plays a crucial role in the process of teachers' attention to teaching, and the principal's teaching leadership practice directly or indirectly improves the teacher's sense of efficacy through teacher cooperation. The study concludes that while these practices may vary in different contexts, principals' leadership practices that focus on teaching and learning still have an impact on the beliefs and practices of teachers in non-Western countries.

Siriparp et al. (2022) explored the regulating effect of teacher role on the relationship between principals' teaching leadership and teachers' self-efficacy. The results show that the principal's teaching leadership regulates the teachers' collective efficacy through the teacher's role, and then affects the teachers' self-efficacy. The results strengthen the theoretical understanding and empirical research on the relationship between principals' teaching leadership and teachers' self-efficacy.

Bi (2021) investigated the current situation of mathematics teachers' self-efficacy in primary schools and found that the overall level of self-efficacy of mathematics teachers in rural primary schools in Hengxian county was relatively high, and the leadership style and task assignment of principals would directly affect teachers' self-efficacy. In addition, social factors such as teachers' status and welfare benefits also have an impact on teachers' self-efficacy. Based on this, H1.

H1: There is a positive correlation between organizational environment and Teachers' self-efficacy

2.2 The impact of Technological support on Teachers' self-efficacy

Based on the theory of rational behavior, Davis (1989) discussed the influencing factors of personal use of computer technology and proposed the famous TAM model of user technology

acceptance, which defined a series of general factors affecting personal use of computer technology. Due to the importance of users' behavioral intention to use technology and its beneficial impact on the effectiveness of technology integration in the educational environment, various models and theories have been developed to quantify users' intention to use technology. Most of them try to establish patterns by extending the TAM model, especially in the field of education (Setiyani et al.,2021; Alfadda & Mahdi,2021; Kamal et al., 2020). Kapici and Akcay (2023) studied how the design of technology-enhanced teaching plans on a virtual platform affected teachers' self-efficacy on technology teaching content knowledge, and how they integrated educational technology into teaching plans. The results showed that the TPACK self-efficacy of teachers was significantly improved after the exploratory technology-enhanced teaching plan was designed on the virtual platform.

Liu et al. (2023) explored the effects of the Stanford DT model on teachers' creative self-efficacy, creative problem solving ability and technological motivation. In this study, quasi-experimental research method was used, and control group was designed before and after the test. A total of 70 teachers participated in the study, in which Stanford DT model was used in the experimental group and conventional teaching methods were used in the control group. The design thinking activity is completed over 12 weeks and consists of three activities in the Modern Educational Technology course. The results showed that there were significant differences in technology-related motivation, creative self-efficacy and creative problem solving between the two groups of students. In the context of technology literacy curriculum, modern educational technology curriculum helps to improve pre-service teachers' creative self-efficacy, creative problem solving ability and technology-related motivation. Based on this, assume H2.

H2: There is a positive correlation between Technological support and Teachers' self-efficacy

2.3 The impact of Teachers' self-efficacy on Teacher's TPACK Level Effectiveness

Self-efficacy is the core concept of social learning theory, which refers to people's expectation that they can successfully complete a task in a specific environment. Self-efficacy determines how people feel, how they think, how they motivate themselves, and how they act. It will affect the individual's goal setting and behavior choice, the formation of individual interest and behavior persistence, the play of individual ability, and the pattern of individual thinking and emotional response (Bandura, 1986). For this study, according to Bandura's self-efficacy theory, teachers' learning and application of TPACK are inevitably influenced and constrained by individual factors, including belief, motivation and self-efficacy.

Dinçer et al. (2024) studied the Turkey's English teacher Technological Pedagogical Content Knowledge (TPACK) and at the intersection between teachers' self-efficacy (TSE). The results of the study revealed a significant predictive relationship between TPACK level and TSE belief, indicating that the self-efficacy of educators significantly affects their TPACK level. Morales et al. (2024) research purpose is to explore teachers' self-efficacy and Technological Pedagogical Content Knowledge significant relationship between (TPACK). The results indicated

a very high or consistently high level of self-efficacy. The study also found that self-efficacy and teachers Technological Pedagogical Content Knowledge (TPACK) there is significant correlation between. This suggests that teachers with a strong sense of efficacy are more likely to have higher TPACK levels.

Auliya et al. (2023) studied the Technological Pedagogical Content Knowledge (TPACK) and teachers' self-efficacy (TSE) on economics teachers' technology integration practice. The results show that TSE has a positive effect on the TPACK of economics teachers. Zhao (2023) took 109 novice middle school English teachers as research objects, aiming to explore the status quo of TPACK level and self-efficacy, the correlation between TPACK and self-efficacy, and the influencing factors of TPACK level and self-efficacy. It is found that there is a significant positive correlation between TPACK and the self-efficacy of novice middle school English teachers. Understanding the self-efficacy of novice English teachers can effectively predict the TPACK level of novice English teachers. Gale et al. (2021) used Self-efficacy theory, it is found that teachers' self-efficacy has a significant impact on teachers' TPACK. They found that teachers' use of technology varies from school to school. These factors include teaching concept, supporting culture, teachers' self-efficacy and professional knowledge, which have a substantial impact on teachers' TPACK. Based on this, H3.

H3: There is a positive correlation between Teachers' self-efficacy and Teacher's TPACK Level Effectiveness

3. Research Methodology

In this study, quantitative research design was used to explore Organizational Environmental and Technological Support through Teachers' self-efficacy (TSE) impact on Teacher's TPACK level effectiveness. Quantitative research design helps to quantify the relationships between variables for a more comprehensive understanding of their interactions (Azam et al.,2021).

Data collection was conducted by questionnaire survey. In this study, a self-administered (closed) questionnaire was used to collect data, and all questions were standardized so that all respondents received the same questions and the same wording. In the questionnaire survey, the Likert five-point scale was used to measure the response of the respondents, including 1 = strong disagreement, 2 = disagree, 3 = neutral, 4 = agree and 5 = strong agreement. Ensure the quantification of data and the accuracy of analysis. The sample size of this study is 400 primary school teachers from Sanmenxia City, Henan Province, which is considered to be enough to represent the characteristics and views of the target population. Through random sampling, we will send survey links to these teachers to collect their feedback and opinions.

This study adopts quantitative method, which is consistent with deductive method. The research paradigm is based on positivism (Thanh,2015). This study will use AMOS software for Structural Equation Model (SEM) analysis. AMOS is a multivariate analysis method that can consider the relationship between observed variables and latent variables at the same time, which is very suitable for the purpose of this study. The analysis of structural equation model will help

to determine the potential factors influencing teachers' TPACK level and their interrelationships. SEM allows us to consider multiple independent variables and mediating effects simultaneously, providing a comprehensive framework for analyzing data. The Structural Equation Model (SEM) was chosen because it can not only consider the relationship between multiple variables at the same time, but also reveal the potential paths between these variables. In addition, SEM also allows us to consider errors and mediating effects, making the analysis more accurate and detailed.

4. Results

Confirmatory factor analysis (CFA) is a kind of "theory testing strategy" based on structural equation model, is used to determine the extent to which retain the existing index factor solution the internal structure of samples of new participants (Mvududu&Sink, 2013). In tool development studies, researchers should collect data from a new sample and calculate CFA to test the match between the dimensions of a hypothetical solution and the new sample (Bandalos&Finney,2019). In addition to evaluating fit metrics, researchers should also consider relevant residuals, parameter estimates, and convergence when evaluating model fit (Bandalos&Finney,2019). The purpose of this study is to test whether the hypothesis model fits well with the sample of influencing factors of teacher TPACK level effectiveness through CFA, and then revise the model. The following is a confirmatory factor analysis (CFA) of the measurement model.

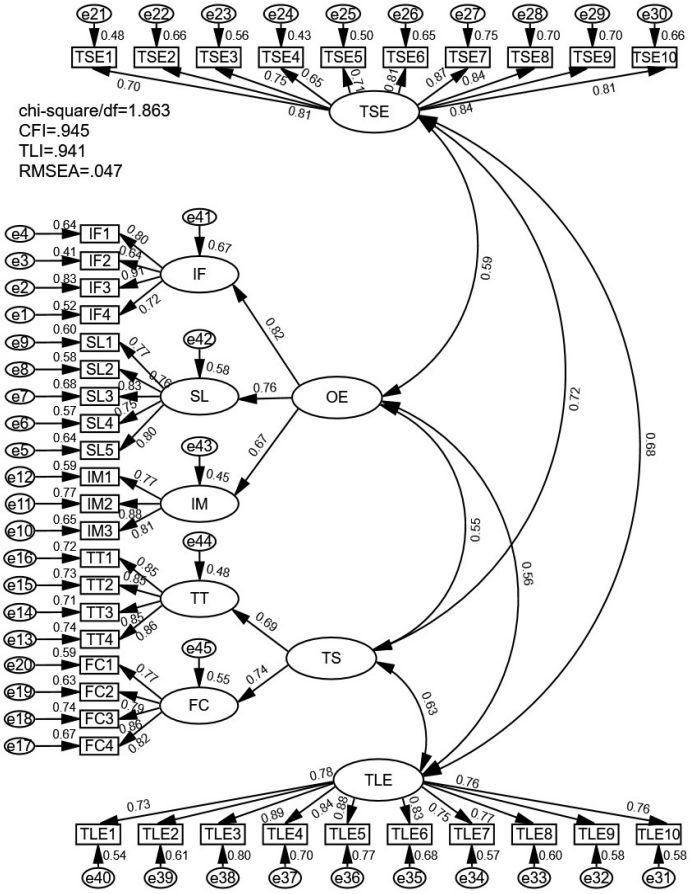

Figure 2 Measurement Model
Source: Developed by the Author

In the confirmatory factor analysis of the measurement model, the fitting degree of the measurement model was tested first, and the result showed that the fitting degree of the measurement model was good (chi-square/df=1.863 CFI=0.945 TLI=0.941 RMSEA=0.047). The values of these indexes show that the model is in good agreement with the actual data (Awang, Afthanorhan & Asri, 2015).

Table 1 Measurement model Fit Results

Fit indicators	Standard value	Statistical results
chi-square/df	<3	1.863
CFI	>0.9	0.945
TLI	>0.9	0.941
RMSEA	<0.08	0.043

Source: Developed by the Author

The convergent validity analysis results of the model are shown in the table below. Each variable and its corresponding factor load form index are greater than 0.5 standard value, and the

Composite Reliability (CR) value of each variable is greater than 0.7, which proves that the observed variables of the same dimension have good reliability and the intrinsic quality of the model is ideal. The Average Variance Extracted (AVE) is greater than 0.5, indicating that the observed variables can effectively reflect the basic characteristics of the common factor dimension, and the convergent validity of the measurement model is good (Hair et al., 2010; Fornell & Larcker,1981).

Table 2 Convergent Validity

Item		Dimension	factor loading	CR	AVE
IF1	<---	IF	0.802	0.855	0.600
IF2	<---	IF	0.643		
IF3	<---	IF	0.908		
IF4	<---	IF	0.719		
SL1	<---	SL	0.773	0.888	0.613
SL2	<---	SL	0.762		
SL3	<---	SL	0.827		
SL4	<---	SL	0.753		
SL5	<---	SL	0.798		
IM1	<---	IM	0.770	0.859	0.671
IM2	<---	IM	0.877		
IM3	<---	IM	0.806		
TT1	<---	TT	0.851	0.913	0.725
TT2	<---	TT	0.852		
TT3	<---	TT	0.845		
TT4	<---	TT	0.858		
FC1	<---	FC	0.771	0.885	0.658
FC2	<---	FC	0.794		
FC3	<---	FC	0.861		
FC4	<---	FC	0.816		
TSE1	<---	TSE	0.695	0.939	0.609
TSE2	<---	TSE	0.812		
TSE3	<---	TSE	0.746		
TSE4	<---	TSE	0.655		
TSE5	<---	TSE	0.709		
TSE6	<---	TSE	0.809		
TSE7	<---	TSE	0.867		
TSE8	<---	TSE	0.836		
TSE9	<---	TSE	0.836		
TSE10	<---	TSE	0.812		
TLE1	<---	TLE	0.733	0.947	0.643
TLE2	<---	TLE	0.778		

TLE3	<---	TLE	0.893
TLE4	<---	TLE	0.838
TLE5	<---	TLE	0.878
TLE6	<---	TLE	0.825
TLE7	<---	TLE	0.754
TLE8	<---	TLE	0.775
TLE9	<---	TLE	0.762
TLE10	<---	TLE	0.765

Source: Developed by the Author

According to Fornell and Larcker (1981), the square root of AVE for each factor needs to be greater than the correlation coefficient for each pair of variables, indicating that the factor has discriminant validity. The square root of each factor AVE is greater than the standardized correlation coefficient outside the diagonal line, indicating that the scale has good discriminant validity.

Table 3 Discriminant validity

	TLE	TSE	FC	TT	IM	SL	IF
TLE	**0.802**						
TSE	0.681	**0.780**					
FC	0.463	0.531	**0.811**				
TT	0.434	0.498	0.513	**0.851**			
IM	0.379	0.397	0.273	0.256	**0.819**		
SL	0.429	0.449	0.308	0.289	0.511	**0.783**	
IF	0.461	0.482	0.332	0.311	0.550	0.622	**0.775**

Source: Developed by the Author

The P-values in path analysis of all hypotheses were less than 0.05, indicating that the hypotheses were statistically significant. In all assumptions, the normalised path coefficients are positive, indicating that the relationship between the variables is positively correlated.

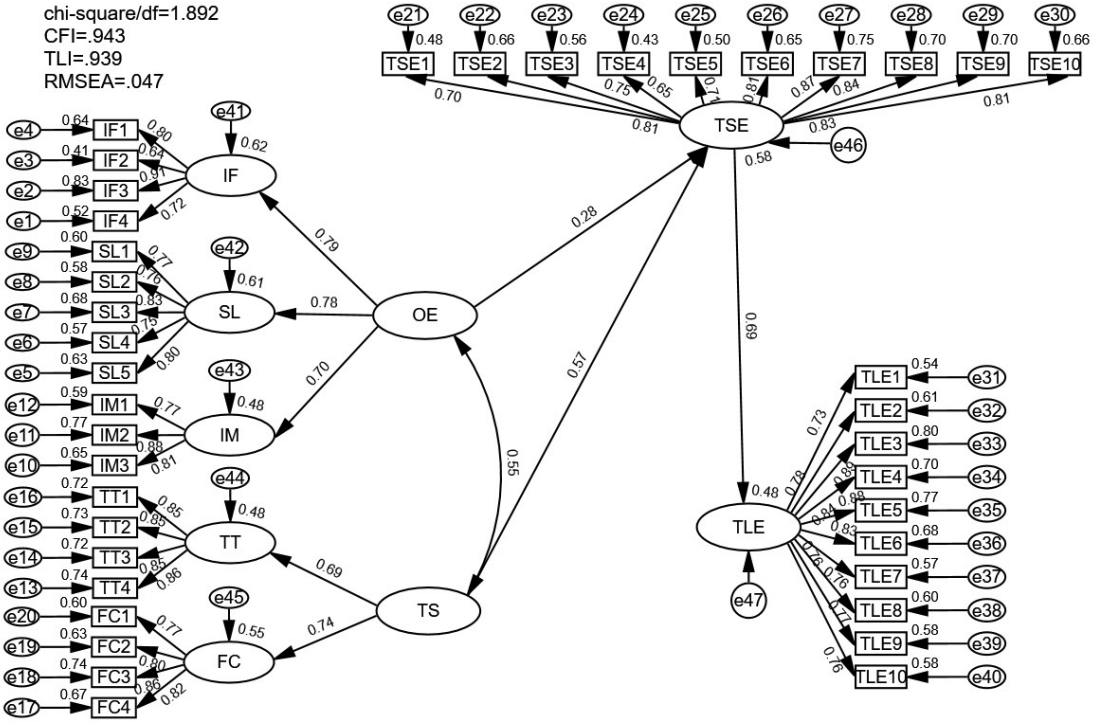

Figure 3 Structural Equation Model
Source: Developed by the Author

Table Error! No text of specified style in document. **Path Analysis**

Hypotheses	Path relationship			Estimate (Standardized)	S.E.	C.R.	P-value	Test result
H1	OE	→	TSE	0.280	0.089	3.878	***	significant
H2	TS	→	TSE	0.573	0.090	6.165	***	significant
H3	TSE	→	TLE	0.690	0.068	11.072	***	significant

Source: Developed by the Author

In this study, Bootstrap algorithm was used to examine the mediating role of TSE. The specific results are shown in the table below, from which it can be seen that the indirect impact of OE on TLE through TSE is 0.436, and the 95% confidence interval does not contain 0, indicating that TSE plays a significant intermediary role between OE and TLE. The indirect effect of TS on TLE through TSE is 0.367, and the 95% confidence interval does not contain 0, indicating that TSE plays a significant mediating role between TS and TLE.

Table 5 Mediation effect test

Parameter	Estimate (Standardized)	Bias-Corrected	Percentile
		95%CI	95%CI

		Lower	Upper	Lower	Upper
OE→TSE→TLE	0.436	0.286	0.633	0.275	0.623
TS→TSE→TLE	0.367	0.202	0.579	0.176	0.541

Source: Developed by the Author

5. Conclusion and Implications

In this study, H1 and H2 verified that there was a statistically significant correlation between organizational environment, technical support and teachers' self-efficacy. According to the current research results, the standardized path coefficient from OE to TSE is 0.280($P<0.05$), indicating that organizational environment has a significant positive impact on teachers' self-efficacy, which means that a good organizational environment can promote teachers' self-efficacy, thereby improving teachers' self-evaluation and confidence. The standardized path coefficient from TS to TSE was 0.573($P<0.05$). The research shows that technical support has a significant positive impact on teachers' self-efficacy. In this study, H3 verified that there was a statistically significant correlation between teachers' self-efficacy and teachers' TPACK level effectiveness. According to the current study results, the standardized path coefficient of TSE to TLE is 0.690($P<0.05$). The results show that teachers' self-efficacy has a significant positive effect on teachers' TPACK level effectiveness. When teachers have a high sense of self-efficacy, they are more motivated to master and apply TPACK knowledge and skills, thus improving teaching results. Conversely, when teachers lack self-efficacy, they may feel helpless and insecure, and have difficulty with the application and integration of technology. Therefore, teachers' self-efficacy is an important factor affecting teachers' TPACK level effectiveness.

Relevant analysis shows that policies, facilities and equipment, training and self-efficacy are significantly related to TPACK of primary school teachers. Therefore, the first is to strengthen the guiding and supporting role of policies. The second is to make full use of facilities and equipment to promote primary school teachers' exposure to technology. The third is to promote the acquisition of TPACK knowledge based on real situations through training. Fourth, create a good atmosphere for primary school teachers to acquire TPACK knowledge. The fifth is to enhance primary school teachers' self-drive for TPACK knowledge acquisition (Chen,2021).

Policy factors refer to the policies, systems, regulations or assessment methods related to teachers' educational technology promulgated by countries, regions or schools, which can have a significant positive impact on the improvement of primary school teachers' TPACK ability through factors affecting self-efficacy. Improving the TPACK level and ability of primary school teachers needs policy guidance and support, and the policy factor is also one of the important external factors of primary school teachers' TPACK level (Xu,2023). Therefore, local governments and schools should make good use of the relevant policies and regulations on educational technology, timely introduce educational technology infrastructure equipment, and increase financial investment in school software and hardware facilities, so that teachers can get better teaching resources in the teaching process, practice their TPACK knowledge in practice, encourage teachers

to study and research skills, improve their sense of self-efficacy, and further improve their TPACK level.

Facilities and equipment mainly refer to the software and hardware facilities of the school. Excellent performance and diversified teaching software and hardware can create a platform for primary school teachers to apply TPACK knowledge to teaching practice. Therefore, in terms of software and hardware facilities, schools should rely on financial, human and material resources such as state support, enterprise co-construction and alumni sponsorship to build online teaching platforms, subject classrooms and recording rooms, so as to remove the external resistance that limits the development of primary school teachers' TPACK ability (Wang,2022). Adequate basic equipment can give teachers full access to the frontiers of modern educational technology, and only after a full understanding of technology can they think about how to integrate technology into teaching. Therefore, to improve the TPACK level of primary school teachers, schools need to provide teachers with facilities and equipment as technical support (Ma,2021).

Self-efficacy refers to primary school teachers' sense of identity on whether they can use educational technology to improve teaching quality, which is the inner motivation that inspires and guides them to learn and use TPACK. In this study, self-efficacy felt the direct influence of policy, training, facilities and equipment conditions. In the path analysis, self-efficacy has the greatest influence on TPACK level. It shows that we should attach great importance to stimulating teachers' self-efficacy to acquire TPACK ability when training teachers' TPACK ability. Based on the above research conclusions, schools should stimulate teachers' motivation to learn TPACK and self-efficacy in using TPACK knowledge through various ways and channels. Schools can carry out special professional identity training for teachers, guide them to realize the nobleness of being a teacher and the quality of being a teacher, and cultivate their thoughts and sentiments of loving education. Schools can also organize young teachers to sit in on classes with teachers who have proven experience in integrating teaching technology into classrooms (Huang,2022). Secondly, improve primary school teachers' sensitivity and application of educational technology to enhance their confidence in the effect of technology application. In daily teaching, guide primary school teachers to combine the educational theoretical knowledge, subject knowledge and technical knowledge and apply them in practice, so as to gradually improve their good expectations for the effect of technology application. Thus forming the correct development concept of TPACK ability. On the other hand, it promotes the teacher's sense of experience and happiness from the psychological level, and increases the positive degree and passion of their efforts to improve their TPACK level (Chen,2021).

Theoretical Significance

Based on literature analysis and scientific data analysis, this study explores the influence of Organizational Environmental and Technological Support on Teacher's TPACK Level Effectiveness through Teachers' self-efficacy. The factors affecting the development of primary school teachers' TPACK level are defined. It works effectively with Technology Knowledge (TK), Pedagogical Knowledge (PK) and Content knowledge (CK) to form a complete TPACK

framework. It makes up and develops the gaps of TPACK knowledge framework in the analysis of " Context " factors, and enriches the research content of TPACK knowledge framework system. It is found that organizational environment and Technological Support have a significant impact on the improvement of Teacher's TPACK Level effectiveness, teachers' self-efficacy plays an mediating effect between organizational environment, Technological Support and teachers' TPACK level effectiveness. By improving the TPACK ability of the trained teachers, the professional quality of the teachers can be improved, and the requirements of the optimization of the talent training system under the background of education informatisation can be realised.

Practical Significance

This study analyzes the factors affecting the TPACK level of primary school teachers in Sanmenxia City, Henan Province, and makes scientific statistics and data analysis on the quantitative relationship among the influencing factors of teachers' TPACK. Considering the composition of influencing factors from both individual and external angles is of great practical significance for teachers to improve the level of information-based teaching and schools to carry out TPACK ability training. First, teachers can make use of the influencing factors of TPACK ability development to improve their information-based teaching ability (Qiu,2022). The influencing factors analyzed in this study have varying degrees of influence on the improvement of TPACK ability, which is helpful for teachers to make self-evaluation by changing one or more influencing factors, so as to improve the ability of information technology and curriculum integration, so as to achieve the purpose of improving information-based teaching ability. Second, to provide practical guidance for primary school TPACK ability training. This study studies the influencing factors of TPACK capacity development, which can provide guidance and support for primary schools to carry out more targeted TPACK capacity development education. Through the research on the relationship between the influencing factors of teachers' TPACK ability development, and starting from various influencing factors, this study puts forward the corresponding strategies to improve teachers' TPACK ability, in order to provide practical guidance for primary school teachers to improve their TPACK level.

Innovations

Compared with previous studies, this study takes teachers' self-efficacy as an intermediary variable in the analysis of Teacher's TPACK Level Effectiveness, which is rare in the existing literature. At the same time, this study fills the gap in the impact of organizational environment and Technological support on Teacher's TPACK Level Effectiveness among primary school teachers in China. From the current research on the influencing factors of Teacher's TPACK Level Effectiveness, there are more studies on pre-service teachers and middle school teachers, but less on primary school teachers, so this study selects primary school teachers as the research object, which provides more theoretical and practical basis for the future development of primary school teachers' TPACK.

Limitation and Future Research Prospects

First, the survey objects are concentrated in Sanmenxia city, Henan Province. The scope of the survey is too narrow to fully reflect the real level of TPACK among primary school teachers in Henan Province. Therefore, if the sample selection range can be expanded under objective conditions, this study will be more scalable and universal. Second, this study adopts quantitative research method. Researchers can properly combine other research methods in the study and conduct in-depth interviews with teachers. Third, there is a lack of comparative studies. Due to time constraints, this study only investigated the effectiveness of TPACK level of teachers who participated in the training, and lacked a comparison of the effectiveness of TPACK level of teachers who did not participate in the training, which could not well reflect the advantages of teacher training.

According to the literature review, there are many other significant factors that affect the effectiveness of teachers' TPACK level. In order to understand in detail the influence mechanism of these factors on the effectiveness of teachers' TPACK level, this study needs to be extended to include these factors. The scale designed in this study should expand the range of sample selection in terms of sample size. Qualitative research is combined with quantitative research and put into practice. Through qualitative research to obtain large-scale, multi-angle research parameters, quantitative test and reasonable evaluation of primary school teachers' TPACK. In addition, set up the TPACK research team of primary school teachers, prolong the research cycle, and conduct more scientific research on the influencing factors of primary school teachers' TPACK.

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