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Teacher-Level Factors, Perceived Institutional Support and Self-Reported Blended Learning Practice among Vocational Teachers in Hunan, China

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Abstract

Blended learning in vocational colleges is associated with both teacher-level factors and the support teachers experience while designing and delivering courses. This cross-sectional survey examined technological literacy, attitudes towards blended learning, content creation

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knowledge, perceived educational service quality, readiness and self-reported practice among 390 vocational teachers recruited through economics departments in Hunan, China. Descriptive statistics, item-level factor evidence, Pearson correlations and multiple regression were used. Construct means clustered near the midpoint of the five-point scales (M = 3.139-3.199). Technological literacy, attitudes, content creation knowledge and perceived educational service quality were positively associated with readiness (R^2 = .370). The same four scores were associated with self-reported practice in Model 1 (R^2 = .412). Adding readiness increased R^2 to .478, while the four earlier coefficients remained significant. The findings support considering teacher capabilities, attitudes and perceived support together. Subject-focused professional learning and support arrangements may warrant pilot evaluation in this regional vocational context.

Keywords: Blended Learning, Vocational Education, Perceived Institutional Support, Teacher Capabilities, Teacher Readiness

Introduction

Blended learning is most useful when online and face-to-face activities are designed as parts of the same course rather than as parallel channels for distributing information. A recorded explanation, an online task or a discussion forum acquires instructional value through its relationship with what students do before and afterwards (Garrison & Vaughan, 2008). This distinction matters because access to digital tools does not itself produce a coherent blend. Teachers still decide which material students can study independently, what requires direct explanation, how participation will be supported and how evidence from online work will inform classroom teaching.

These decisions are unusually visible in vocational education. Vocational courses need to link abstract ideas to tasks that students may encounter in the workplace. This can be difficult because learners enter with different levels of academic preparation and do not always have equal access to digital resources. Online materials allow students to revisit content, prepare before class and spend more time working through complex ideas. Face-to-face sessions can then focus on clarification, supervised practice and feedback. The proportion of online and classroom teaching should therefore vary according to the subject matter, the activity and the needs of the students. Research with vocational teachers has consequently linked their conceptions of blended learning to the approaches they take in course design and teaching (Bliuc et al., 2012).

Economics teaching provides a useful setting in which to examine that work. Teachers can use digital resources to introduce current market data, financial cases, visual models and short simulations. Students might inspect a data series before class and then compare interpretations or make a decision during a classroom activity. Yet current data must be checked, abstract relationships must be explained at an appropriate level, and online work must be connected to assessment and feedback. Operational confidence with a platform is helpful, but it is not equivalent to being able to design accurate, accessible and purposeful economics content.

Teacher-level conditions are only one side of implementation. A teacher may be willing and technically competent but still face unreliable systems, fragmented professional development or little assistance with content production. Conversely, a college may invest in infrastructure without ensuring that teachers can use it for subject-specific learning. Studies of institutional blended learning adoption identify strategy, infrastructure, support and organisational arrangements as conditions associated with faculty use (Galvis, 2018; Porter & Graham, 2016). Research in Chinese higher vocational colleges likewise links teachers' instructional use of technology with both psychological perceptions and external support conditions (Yang et al., 2023).

Recent empirical studies reinforce this tension between individual capability and institutional context. In a survey of 2,514 Chinese TVET teachers, Xin et al. (2024) found that digital competence varied with both individual characteristics and external conditions, including institutional digitisation and participation in digital training. Research on blended learning adoption also shows that expected influences do not operate uniformly: Dahri et al. (2024), studying 350 teachers, found strong links between motivation and adoption intentions, while some anticipated effects of the educational environment were not significant. More recently, Deng et al. (2025) reported that positive dispositions towards blended teaching could coexist with weaker technological, planning and pedagogical readiness, alongside differences across school types. Together, these findings shift attention from technology acceptance alone to the way professional capability, judgement and organisational conditions combine in teaching practice.

The present study therefore treats blended learning implementation as an individual–institutional problem. Technological literacy and content creation knowledge are examined as capabilities, while attitudes towards blended learning are treated as an evaluative teacher-level condition. Educational service quality records teachers' perceptions of the vision, resources, professional development and technical assistance surrounding blended teaching. Readiness denotes perceived preparedness, and self-reported practice records teachers' accounts of using blended approaches. The questionnaire does not provide an independent audit of colleges.

This framing also separates readiness from practice. Readiness can summarise confidence and perceived capacity before or during implementation, but it is not evidence that a coherent blended course has been delivered. Practice continues to draw on technical operation, content decisions and support when a course is running. Studies that stop at intention or readiness may therefore miss conditions that remain relevant during enactment. Examining a hierarchical practice model makes it possible to ask whether readiness adds explanatory information after capability and perceived support have been considered.

The research problem is therefore not simply whether teachers report favourable attitudes or sufficient digital skills, but whether perceived preparedness and reported enactment remain distinct once capabilities and support conditions are considered together. This distinction connects the study to a wider social-science question about digital transformation in professional work: technology use can be understood as an individual adoption decision, but it is also an organisationally situated practice shaped by resources, expectations and access to support. The present study contributes to this discussion by separating readiness from self-reported practice and by estimating whether readiness adds explanatory information after technological literacy, attitudes, content creation knowledge and perceived educational service quality have been considered. Hunan provides a bounded provincial context for this investigation, and the study does not attempt to represent every region of China. It focuses on vocational teachers recruited through economics departments. In this setting, blended learning can make greater use of current data and practical problems, but it also requires teachers to develop and update digital materials regularly.

Blended Learning in Vocational Education

Blended learning is most effective when activities in the online and face-to-face environments are designed to lead into one another. Adding more online components does not necessarily improve a course. An online task that has no clear purpose or is never discussed again in class may simply increase students' workload. Its value is greater when it helps students examine evidence, rehearse a process or arrive in class with questions to explore. Research in higher education points to the same conclusion: outcomes depend largely on how blended teaching is organised (Anthony et al., 2019).

This issue is especially visible in vocational education. Recorded demonstrations allow students to review procedures, whereas classrooms and workshops give teachers opportunities to observe performance and correct mistakes. Digital materials can also expose learners to examples or situations that a college cannot easily reproduce on site. Their usefulness, however, depends on whether students understand how the online work relates to occupational judgement and assessed tasks. Studies of vocational students indicate that blended formats are often viewed positively, but favourable perceptions do not remove difficulties in course design, access or teacher support (Puspitasari & Soeharto, 2019).

Economics teaching adds a further challenge because teachers frequently move between abstract representation and practical interpretation. A visualisation may help students notice a relationship, but they still need to question its assumptions and explain what a change means. Current cases can make a topic more relevant, although they also need to be revised as circumstances change. Economics teachers therefore require both practical digital skills and the ability to develop or adapt subject-specific materials.

Teacher-Level Factors for Blended Learning

The study is organised around two broad influences: factors located at the teacher level and the conditions that make technology use easier or harder. UTAUT is useful here because it treats actual use as dependent not only on expectations and intentions, but also on the support available to users (Venkatesh et al., 2003). In teaching settings, this support may take the form of reliable platforms, relevant professional development, accessible technical help and workable institutional arrangements. TPACK offers a complementary account of the knowledge needed when technology is brought into a subject (Mishra & Koehler, 2006). In this study, technological literacy and content creation knowledge are capabilities; attitudes remain analytically separate.

Technological literacy refers here to teachers' perceived capacity to operate digital tools, communicate through platforms and handle routine technical problems. It can lower the effort involved in preparing and delivering a blended course. It also expands the range of activities that a teacher can realistically consider. The relationship with teaching is not automatic, however. Knowing how to use a tool does not determine whether it is appropriate for an economics concept or whether students will understand the task. Research on teacher technology change has similarly argued that knowledge, confidence, beliefs and culture intersect rather than operate separately (Ertmer & Ottenbreit-Leftwich, 2010).

Attitudes towards blended learning concern teachers' evaluations of its usefulness and place in their work. Redesigning a familiar course takes time and carries practical risk, so a teacher's judgement that blended learning will improve teaching can matter. Attitudes also reflect experience. Hesitation may be a considered response to unstable systems, weak student participation or an activity that adds little educational value. The construct is therefore examined beside capability and support, not treated as a personal deficiency to be corrected through persuasion. Almousa et al. (2023) likewise connect teachers' attitudes with their training needs.

Knowledge to create content is the most explicitly pedagogical capability in the framework. This capability covers the work involved in producing digital materials for blended teaching, including creating, revising and reviewing them. Simply uploading lecture slides is not enough. Students need to know what they are expected to do, the task must be manageable, and the online activity should connect with what happens later in class. In economics, teachers must also judge whether data are reliable, decide how ideas are presented visually, explain abstract relationships clearly and choose cases that remain relevant. TPACK is useful for understanding how these decisions bring together technology, pedagogy and subject knowledge (Mishra & Koehler, 2006).

Perceived Institutional Support and Educational Service Quality

The questionnaire retains the original term educational service quality. The ten items cover several aspects of institutional provision, including strategic direction, professional development, ICT infrastructure, communication, programme review, technical support, content resources and support for teacher adaptation. Their average is used as an overall indicator of how teachers perceive the educational services available to them. Since these items refer to different areas of provision, the resulting score is not treated as a single objective characteristic of the institution.

The score therefore reflects each teacher's own experience of the support available in practice. It cannot be used to infer institutional expenditure, staffing levels or the overall quality of a college. Even within the same institution, teachers may report different experiences because their courses, schedules and support needs are not identical. Philipsen et al. (2022) also examine institutional support through teachers' perceptions of professional development arrangements and how those arrangements operate.

The ten items show why the composite is broader than customer satisfaction. They cover direction, learning opportunities, infrastructure, staff support and evaluation. The label perceived institutional support is used only as an interpretive description of this teacher-reported composite, not as a claim that a single latent institutional property has been established. Comparable external conditions have been identified in Chinese higher vocational education (Yang et al., 2023).

Teacher Readiness and Self-Reported Practice

Readiness is treated as teachers' perceived preparedness to implement blended learning, including confidence in managing online and face-to-face components. It is close to practice but conceptually distinct. A teacher can feel prepared before an opportunity to redesign a course arises. Another may use required online elements while remaining uncertain about their quality. Research in technical and vocational education has likewise described blended learning readiness as multidimensional rather than as a single technical skill (Shakeel et al., 2023).

The practice construct records teachers' own accounts of incorporating online elements, using synchronous and asynchronous activity and connecting digital and classroom work. The term self-reported practice is used consistently because the study did not observe classes or evaluate course artefacts. These scores indicate reported enactment, not the quality of an individual course or its effect on students. That boundary is especially important when interpreting positive associations: the analysis concerns relationships among teachers' questionnaire scores.

Figure 1 separates the simultaneous readiness regression from the hierarchical practice regression. All variables are observed composite scores. The arrows denote adjusted statistical associations and do not imply temporal order or causal effects.

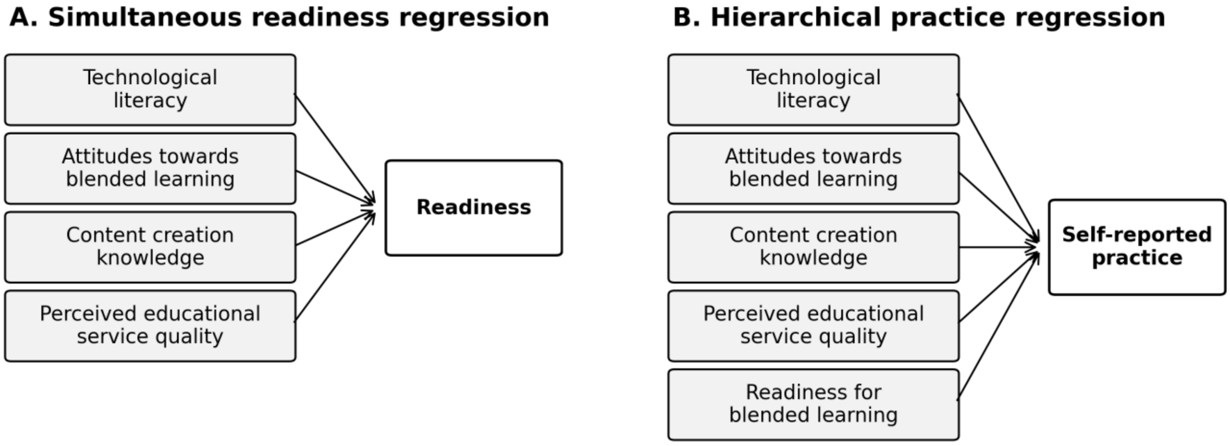

Figure 1. Regression models using observed composite scores. Arrows represent adjusted statistical associations, not causal effects.

Research Questions

The study addresses the following questions:

RQ1. What are the levels and variability of the six reported construct scores among vocational teachers recruited through economics departments in Hunan?

RQ2. How are technological literacy, attitudes, content creation knowledge and perceived educational service quality associated with readiness for blended learning?

RQ3. Does readiness add explanatory information for self-reported blended learning practice after the teacher-level factors and perceived educational service quality are considered?

Method

Research Design

A quantitative cross-sectional survey was used to describe the six construct scores and estimate associations among them at one point in time. Concurrent measurement precludes conclusions about temporal order or causation; coefficients are interpreted as adjusted associations among observed questionnaire scores.

Participants and Research Context

The recruitment frame concerned teachers of economics-related subjects in vocational colleges in Hunan Province. The institutional list covered 149 vocational colleges, 137 regular vocational colleges and 12 adult vocational colleges. This figure describes the recruitment frame, not the number of colleges represented by completed questionnaires. Because the number of eligible teachers was not fixed, the planning calculation used Cochran's large- or unknown-population formula, $n_0 = z^2p\ (1 - p)/e^2$, with $z = 1.96$, $p = .50$ and $e = .05$ (Cochran, 1977). The resulting benchmark was approximately 384 cases, and the target was set at 390. This calculation informed sample planning but does not itself establish population representativeness.

Recruitment was organised through institutional administrative channels. Official economics-department faculty lists were used to identify eligible teachers, and institutional contacts circulated the survey link under the study's selection procedure. The final sample is therefore described as vocational teachers recruited through economics departments rather than as a province-wide probability sample of all vocational teachers. The final sample contained 390 vocational teachers recruited through economics departments (Table 1). The economics-area item listed financial economics, international economics, macroeconomics and microeconomics. Four respondents selected the option “No Teaching Economic Subject”; the analysis retained them and therefore does not describe all respondents as current economics teachers.

Table 1
Demographic of Respondents

Variable	**Category**	**n**	**%**
Gender	Female	209	53.59
	Male	181	46.41
Age	Under 25 years	78	20.00
	25–34 years	115	29.49
	35–44 years	122	31.28
	45–54 years	43	11.03
	55 years or above	32	8.21
Highest qualification	Bachelor’s degree	110	28.21
	Master’s degree	202	51.79
	Doctorate	78	20.00
Teaching experience	Less than 1 year	83	21.28
	1–3 years	83	21.28
	4–6 years	96	24.62
	7–10 years	77	19.74
	More than 10 years	51	13.08
Economics teaching area	Financial economics	102	26.15
	International economics	100	25.64
	Macroeconomics	92	23.59
	Microeconomics	92	23.59
	Not currently teaching an economics subject	4	1.03

Note. N = 390. The category shown as “Not currently teaching an economics subject” reproduces the meaning of the original option “No Teaching Economic Subject”. “Maybe” is the questionnaire’s original training-response option and is not interpreted as confirmed training.

Research Instrument

The structured questionnaire contained eight demographic items and 56 closed-ended construct items. Technological literacy, attitudes towards blended learning, educational service quality and content creation knowledge each comprised ten items; readiness and practice each comprised eight. The construct items used a five-point agreement scale from 1 (strongly disagree) to 5 (strongly agree). The administered questionnaire reproduced in the dissertation was in English. During the 30-teacher pilot, participants assessed the wording, instructions and comprehensibility of the instrument, and their feedback informed the revised main-survey version. The pilot served as a practical comprehension check in the study context.

The scale items were adapted from sources listed in the study protocol. The technological literacy items were based on a digital technology literacy profile (Ma'rufah Rohmanurmeta et al., 2024). Items measuring attitudes were drawn from research on teachers' attitudes towards blended learning and their related training needs (Almousa et al., 2023). The content creation items addressed the combined use of technological, pedagogical and subject knowledge (Nursyifa et al., 2020; Philipsen et al., 2022). Measures of readiness and practice were informed by earlier work on blended learning readiness and adoption (Dahri et al., 2024; Shakeel et al., 2023).

Examples of the item wording show how the constructs were separated. Technological literacy included "I can effectively use various digital tools for teaching economics"; attitudes included "I believe blended learning increases the effectiveness of economics teaching"; content creation knowledge included "I can create digital content that effectively explains complex economic concepts to students"; readiness included "I feel prepared to implement blended learning in my economics courses"; and practice included "I currently incorporate online elements into my economics teaching."

The educational service quality scale was adapted at the construct level from Yang et al. (2023) and Philipsen et al. (2022). All ten items are presented in Table 2. In the present study, they are combined into a single index of teachers' perceived educational service quality. The institutional-dimension labels shown in the final column were added only to describe the content of the items and should not be read as separately validated subscales.

Table 2
Educational Service Quality Items

Item	Questionnaire wording	Institutional dimension
1	In our institution, there is a clear vision towards blended learning implementation in economics education.	Strategic vision
2	Our institution provides a supportive environment for professional development in blended learning.	Professional-development climate
3	There are clear objectives regarding blended learning implementation in our economics department.	Objectives and direction
4	The current ICT infrastructure adequately supports blended learning professional development.	ICT infrastructure
5	The institution pays attention to teacher adaptation processes when implementing blended learning.	Teacher adaptation
6	There is a well-defined professional development strategy for blended learning integration.	Development strategy
7	Information about blended learning training opportunities is systematically shared.	Communication
8	The effectiveness of blended learning professional development programs is regularly evaluated.	Programme evaluation
9	Technical support staff is readily available to assist with blended learning implementation.	Technical support
10	The institution provides adequate resources for creating and delivering blended learning content.	Content resources

Pilot Study and Survey Procedure

A pilot survey was completed by 30 economics teachers from colleges that were not involved in the main administration. The group included teachers of different ages, levels of experience and genders. The pilot was used to check whether the items and instructions were clear, whether the content was relevant, how long the questionnaire took to complete and whether Google Forms worked as intended. Participants were also asked to identify any English wording they found difficult to understand or answer. Their comments were used to revise the questionnaire, and none of the pilot responses were included in the final sample.

In the main survey, institutional contacts shared the Google Forms link through official faculty lists from economics departments. Both the platform and the instructions had already been tested during the pilot. The information sheet explained that participation was voluntary, responses were anonymous and confidential, the data would be used only for research, and the questionnaire would take about 15–20 minutes to complete. Proceeding to Part 1 recorded informed consent. The final response table contained 390 complete questionnaires, and no submitted questionnaire was classified as invalid.

Data Analysis

IBM SPSS Statistics version 26.0 was used for all reported analyses. These comprised frequencies, descriptive statistics, reliability analysis, factor-related measurement evidence, Pearson correlations, a simultaneous multiple linear regression for readiness and a hierarchical multiple linear regression for self-reported practice. The regression estimates used ordinary least squares. Construct scores were calculated from their respective items. Means and standard deviations summarised the scores; the scale midpoint of 3 was used only as a descriptive reference.

Internal consistency was assessed with Cronbach's alpha. KMO and Bartlett's test evaluated the factorability of all 56 construct items. Using the same 390-response main sample, the source study reported a six-factor exploratory solution and a separate table of standardised item loadings, followed by average variance extracted (AVE), composite reliability (CR), the Fornell-Larcker criterion and HTMT ratios. No independent validation sample was used. Appendix A therefore labels the later values as reported standardised loadings rather than as independent confirmatory evidence. AVE, CR and HTMT are treated as within-sample measurement evidence and not as proof of a fully validated measurement model (Fornell & Larcker, 1981; Henseler et al., 2015).

Skewness (-0.470 to -0.289) and kurtosis (-0.646 to -0.331) described the six composite-score distributions. Pearson correlations summarised bivariate associations. A simultaneous multiple linear regression estimated the adjusted associations of technological literacy, attitudes, perceived educational service quality and content creation knowledge with readiness. A hierarchical multiple linear regression predicted self-reported practice, entering the same four scores in Model 1 and readiness in Model 2. This order addressed whether readiness added information after the other observed conditions. Unstandardised coefficients, standard errors, standardised coefficients, t statistics, p values and the source-reported 95% confidence intervals are presented. Statistical significance was assessed at $p < .05$.

Results

Participant Characteristics

Women accounted for 53.59% of the sample and men for 46.41% (Table 1). Respondents aged 35–44 formed the largest age group (31.28%); those aged 25–34 accounted for a further 29.49%. A master’s degree was the most common qualification (51.79%), compared with 28.21% for a bachelor’s degree and 20.00% for a doctorate. All five teaching-experience categories were represented, with 4–6 years the largest single group (24.62%).

The four principal economics areas were similar in size: financial economics 26.15%, international economics 25.64%, macroeconomics 23.59% and microeconomics 23.59%. Four respondents (1.03%) selected “No Teaching Economic Subject”. For formal blended learning training, 40.00% selected Yes, 20.00% No and 40.00% the original response option Maybe. The use-frequency item showed that 23.08% always used blended approaches, 20.00% often, 30.00% sometimes, 18.72% rarely and 8.21% never. Thus, 285 respondents (73.08%) reported use at least sometimes, although this item does not indicate the depth or quality of the blend.

Levels of the Main Constructs

The six means clustered near the scale midpoint (Table 3). Attitudes towards blended learning had the lowest mean (M = 3.139, SD = 1.187), while readiness had the highest (M = 3.199, SD = 1.076). Perceived educational service quality was nearly identical (M = 3.198, SD = 1.171). Technological literacy (M = 3.163, SD = 1.158), content creation knowledge (M = 3.158, SD = 1.196) and self-reported practice (M = 3.167, SD = 1.159) lay between them.

Table 3
Descriptive Statistics, Reliability and Convergent Evidence

Construct	Items	M	SD	α	AVE	CR
Technological literacy	10	3.163	1.158	.959	.697	.958
Attitudes towards blended learning	10	3.139	1.187	.957	.690	.957
Perceived educational service quality	10	3.198	1.171	.957	.692	.957
Content creation knowledge	10	3.158	1.196	.959	.702	.959
Readiness for blended learning	8	3.199	1.076	.941	.668	.941
Self-reported blended learning practice	8	3.167	1.159	.945	.684	.945

Note. N = 390. Scores range from 1 to 5. AVE = average variance extracted; CR = composite reliability. Reliability values are from the main sample.

Only 0.060 separated the lowest and highest mean. RQ1 is therefore answered by six scores centred near the midpoint, with standard deviations above 1.0 showing appreciable variability. The study did not formally compare construct means and does not identify attitudes as a statistically weaker domain.

Reliability and Factor-Related Measurement Evidence

Cronbach's alpha ranged from .941 to .959 (Table 3). The values indicate high internal consistency, while also raising the possibility of item redundancy (Taber, 2018). For the 56 items, KMO was .868 and Bartlett's test was significant, $\chi^2(1540) = 32{,}158.973$, $p < .001$. The six-factor exploratory solution reported eigenvalues of 7.493, 7.370, 7.319, 7.244, 5.658 and 5.543 and 72.550% cumulative variance. Appendix A reports the exploratory loadings and the later standardised loadings from the same sample.

AVE ranged from .668 to .702 and CR from .941 to .959. All HTMT ratios were below .85 (Table 4), with the largest value (.629) between readiness and practice. These within-sample results are consistent with six distinguishable composite scores, but they are not an independent confirmation and do not rule out alternative measurement models. The heterogeneous educational service quality measure is therefore interpreted as a composite index.

Table 4
Heterotrait–Monotrait Ratios

Construct	1	2	3	4	5	6
1. Technological literacy	—					
2. Attitudes	.482	—				
3. Perceived educational service quality	.565	.477	—			
4. Content creation knowledge	.477	.469	.437	—		
5. Readiness	.532	.475	.500	.469	—	
6. Practice	.560	.498	.522	.504	.629	—

Note. Lower-triangle values are reported. HTMT values were calculated from item-level correlations; all were below .85.

Relationships among Teacher-Level Factors, Perceived Support, Readiness and Practice

Every bivariate correlation was positive and significant at $p < .01$ (Table 5). Self-reported practice correlated most strongly with readiness ($r = .593$), followed by technological literacy ($r = .533$), perceived educational service quality ($r = .496$), content creation knowledge ($r = .480$) and attitudes ($r = .474$). Readiness correlated with technological literacy at $r = .506$, perceived educational service quality at $r = .475$, attitudes at $r = .451$ and content creation knowledge at $r = .446$.

Table 5
Pearson Correlations among the Main Constructs

Construct	1	2	3	4	5	6
1. Technological literacy	1					
2. Attitudes	.462	1				
3. Perceived educational service quality	.542	.456	1			
4. Content creation knowledge	.458	.450	.419	1		
5. Readiness	.506	.451	.475	.446	1	
6. Practice	.533	.474	.496	.480	.593	1

Note. $N = 390$. All off-diagonal correlations are significant at $p < .01$ (two-tailed).

The correlations establish that the capability and support measures were each related to readiness and practice. The multivariable models show whether the associations remained after the other predictors were considered.

Associations with Readiness for Blended Learning

The simultaneous readiness regression had $R^2 = .370$. Each coefficient was positive and significant (Table 6). Technological literacy had $\beta = .241$, followed by perceived educational service quality ($\beta = .191$), content creation knowledge ($\beta = .178$) and attitudes ($\beta = .172$), all $p < .001$.

Table 6

Simultaneous Multiple Regression for Readiness for Blended Learning

Predictor	B	SE	β	t	p	95% CI for B
Technological literacy	.224	.048	.241	4.702	< .001	[.130, .318]
Attitudes towards blended learning	.156	.044	.172	3.529	< .001	[.069, .243]
Perceived educational service quality	.176	.046	.191	3.800	< .001	[.085, .267]
Content creation knowledge	.160	.043	.178	3.704	< .001	[.075, .245]

Note. N = 390. $R^2 = .370$. B = unstandardised coefficient; SE = standard error; β = standardised coefficient. The 95% confidence intervals reproduce the coefficient intervals reported in the source analysis.

For RQ2, each teacher-level factor and perceived educational service quality had a positive adjusted association with readiness. The ordering of coefficients is descriptive and is not a formal comparison of practical priority.

Predictors of Self-Reported Blended Learning Practice

In Model 1, the two teacher capabilities, attitudes and perceived educational service quality were associated with $R^2 = .412$ for self-reported practice, adjusted $R^2 = .406$, $F(4, 385) = 67.535$, $p < .001$ (Table 7). All four coefficients were positive and significant.

Table 7

Hierarchical Regression Predicting Self-Reported Blended Learning Practice

Model	Predictor	B	SE	β	t	p	95% CI for B
1	Constant	.587	.164	—	3.586	< .001	—
	Technological literacy	.254	.050	.253	5.082	< .001	[.156, .352]
	Attitudes towards blended learning	.174	.046	.178	3.754	< .001	[.083, .265]
	Content creation knowledge	.197	.045	.203	4.343	< .001	[.108, .285]
	Perceived educational service quality	.191	.049	.193	3.936	< .001	[.096, .286]
2	Constant	.264	.161	—	1.637	.102	—
	Technological literacy	.176	.048	.176	3.632	< .001	[.081, .271]

Model	Predictor	B	SE	β	t	p	95% CI for B
	Attitudes towards blended learning	.120	.044	.123	2.696	.007	[.033, .207]
	Content creation knowledge	.141	.043	.145	3.244	.001	[.056, .226]
	Perceived educational service quality	.130	.047	.131	2.786	.006	[.039, .221]
	Readiness for blended learning	.347	.050	.322	6.927	< .001	[.249, .445]

Note. N = 390. Model 1: $R^2 = .412$, adjusted $R^2 = .406$, $F(4, 385) = 67.535$, $p < .001$. Model 2: $R^2 = .478$, adjusted $R^2 = .471$, $F(5, 384) = 70.216$, $p < .001$. $\Delta R^2 = .065$; $\Delta F(1, 384) = 47.978$, $p < .001$. Confidence intervals reproduce the source coefficient output.

Adding readiness increased R^2 to .478, adjusted $R^2 = .471$, $\Delta R^2 = .065$, $\Delta F(1, 384) = 47.978$, $p < .001$. Readiness had $\beta = .322$ ($p < .001$). Technological literacy ($\beta = .176$, $p < .001$), content creation knowledge ($\beta = .145$, $p = .001$), perceived educational service quality ($\beta = .131$, $p = .006$) and attitudes ($\beta = .123$, $p = .007$) retained significant coefficients.

For RQ3, readiness added explanatory information after the other four scores were considered. This is an adjusted association within one cross-sectional survey, not evidence that readiness temporally mediates implementation.

Discussion

Construct Distributions and Shared Variation

The six mean scores were all close to the midpoint of the scale, and the gap between the highest and lowest was only 0.060. This pattern does not suggest that teachers felt highly prepared while institutional support was weak, nor does it point to attitudes as a distinct obstacle. The differences among respondents were more notable than the differences among the construct means, as every standard deviation was above 1.0.

The independent use-frequency item showed: 73.08% reported using blended approaches at least sometimes, while 26.92% selected rarely or never. It was not analysed as a criterion-validity test, so it cannot establish what the practice scale measures beyond the reported item content. It does, however, caution against designing one uniform professional development response.

Attitudes should not be treated as a capability deficit. Their mean was only marginally below the other scores, and no formal mean comparison was conducted. Evaluations of blended learning may reflect workload, student participation, platform reliability and perceived educational value as well as personal preference.

Teacher-Level Factors and Readiness

Technological literacy had the largest standardised coefficient in the readiness model. Operational fluency can reduce uncertainty when teachers decide whether they can prepare and manage a blended course. The ability to use digital tools, communicate through a platform and resolve routine problems makes a broader range of teaching arrangements feasible. This fits UTAUT's account of effort and facilitating conditions and the wider observation that teacher knowledge and confidence develop within an organisational culture (Ertmer & Ottenbreit-Leftwich, 2010; Venkatesh et al., 2003).

The other capability coefficients show why technical training alone is insufficient. Content creation knowledge remained associated with readiness after technological literacy was considered. Economics teachers must decide how to explain a model, whether a data source is suitable, what students should produce online and how that work will be used in class. These are pedagogical and disciplinary decisions as much as technical ones. TPACK gives a useful explanation: technology becomes instructional knowledge when it is integrated with content and pedagogy (Mishra & Koehler, 2006).

Attitudes also retained an adjusted association with readiness. Teachers who see blended learning as useful and manageable may be more willing to undertake the work of redesign. Yet the coefficient was the smallest of the four, and it should not be read as evidence that implementation mainly requires a change of mindset. Attitudes are formed through practical experience. A teacher who has encountered weak connectivity, unclear requirements or poorly attended online sessions may have reasonable reservations. Professional development should therefore allow teachers to test a design, receive assistance and judge its value in relation to their own course.

Perceived Institutional Support as an Enabling Condition

The perceived educational service quality composite was associated with readiness and retained a significant coefficient in both practice models. This supports including teachers' experience of the institutional environment in the account, but it does not establish that any single service dimension caused implementation.

Its ten items cover distinct domains: vision, objectives, professional development, ICT infrastructure, teacher adaptation, communication, evaluation, technical assistance and content resources. Averaging them provides a broad perception index. A high score cannot identify which domain is responsible, and the index should not be used to rank colleges. Future work should compare one-factor, correlated-domain and higher-order specifications.

The practical value of the composite lies in how support is encountered. A general helpdesk may not address the design of an economics assessment, while a one-off workshop may not assist a teacher during course delivery. Philipsen et al. (2022) and Zhao and Song (2021) similarly distinguish the structure of professional support from the forms of assistance teachers can use.

The coefficient for perceived educational service quality decreased from $\beta = .193$ in Model 1 to $\beta = .131$ after readiness was entered, but remained significant. The pattern is compatible with support being related both to perceived preparedness and to reported practice. Because the measures were concurrent, it cannot establish a temporal pathway.

Readiness and Self-Reported Practice

Readiness added 6.5 percentage points of explained variance and had β = .322 in the final model. It records a more immediate judgement of preparedness than the capability, attitude and support scores. The result is consistent with TVET work that treats readiness as distinct from technical skill (Shakeel et al., 2023).

Readiness did not absorb the other coefficients. Technological literacy, attitudes, content creation knowledge and perceived educational service quality remained associated with practice. The finding therefore supports treating perceived preparedness and reported practice as related but distinct, without suggesting that one causes or mediates the other.

The predictors were moderately related to one another and were measured in the same questionnaire, so the coefficients should be interpreted with care. Their size may partly reflect overlap in item content and differences in how the scales were constructed. Readiness contributed additional explanatory information in this model, but the results do not show that it should be treated as the leading target for intervention in practice.

Theoretical Implications

Rather than proposing a new theory of technology acceptance, the study provides a concise framework that can be examined in later research. UTAUT helps organise attitudes and perceived facilitating conditions, whereas TPACK helps explain why technological literacy should not be treated as the same capability as creating subject-specific digital content (Mishra & Koehler, 2006; Venkatesh et al., 2003). The relationships found in the present study are broadly consistent with both perspectives.

One possibility is that readiness is shaped partly by the fit between teachers and the institutional support available to them, rather than being a stable personal characteristic. The cross-sectional design cannot test this possibility directly. The findings also indicate that readiness and practice are related but not interchangeable. Readiness increased the explanatory power of the practice model, while the other four variables continued to show adjusted associations. Longitudinal research could examine whether changes in teacher capability or institutional provision are followed by changes in readiness and, subsequently, teaching practice.

The findings also show why the level of measurement matters. Educational service quality was assessed through teachers' reports and therefore represents perceived facilitating conditions rather than an objective measure of institutional provision. Future studies could combine these perceptions with college-level evidence, such as staffing levels, platform availability, professional development schedules and technical-service records. This would make it possible to examine whether formal support is experienced consistently by teachers and whether institutional conditions explain additional variation beyond individual capability.

Policy Implications

The findings point to three related areas that vocational colleges could test on a pilot basis.

One is professional development that combines technical training with the production of a usable subject-specific resource. For example, an economics teacher might design a short online activity using current data, revise it after feedback from colleagues and technical staff, and then try it in an actual course. This type of task-based development is more likely to connect software use with teaching decisions than a stand-alone demonstration of digital tools (Amemasor et al., 2025; OECD, 2025).

Second, departments could pilot shared digital content production. Editable cases, data activities and assessment prompts may reduce duplicated labour if subject teachers retain responsibility for accuracy and pedagogy and technical staff assist with accessibility and platform compatibility (Paniagua & Istance, 2018; Xie et al., 2017).

Third, colleges could test a visible service pathway that links professional learning, platform access and timely technical or pedagogical assistance. Its value should be evaluated through teacher feedback and course evidence. The present associations do not demonstrate that any one arrangement will improve practice.

Limitations and Future Research
The cross-sectional design identifies associations, not temporal order or causation. All core variables were self-reported by the same respondent at one point in time. Anonymous participation, neutral instructions and the statement that there were no right or wrong answers were used to reduce evaluation pressure, although social desirability and consistent response patterns may still affect the estimates.

The fitted regressions were specified around the study's three research questions and did not add post-hoc demographic or training controls. Future studies could identify these variables in advance and follow teachers over time or account for differences between institutions. This would help determine whether the relationships found here are also present across different teacher groups and college contexts.

The study is limited to Hunan and to teachers reached through economics departments. The figure of 149 colleges refers only to the institutional list used for recruitment; it does not mean that completed questionnaires were received from all 149 institutions. The sample should therefore not be treated as a probability sample representing every vocational teacher in the province. The 30-teacher pilot was used to check whether the English questionnaire was understandable and clearly worded. Later studies could strengthen this process through formal translation procedures and cognitive interviews.

The item-level analyses were conducted using the same 390 responses as the main analysis, so they provide evidence from within the sample rather than an independent validation. Other possible measurement structures were not tested. This is particularly relevant to the educational service quality index, which brings together several different areas of support, and to the reliability coefficients above .94. In addition, four respondents selected “No Teaching Economic Subject”. Future questionnaires should screen eligibility before participants proceed to the main items.

Conclusion
The study included 390 vocational teachers who were contacted through economics departments in Hunan. Average scores for all six constructs remained close to the midpoint

of the five-point scale, although responses varied considerably across participants. Technological literacy, attitudes, content creation knowledge and perceived educational service quality were all related to both readiness and teachers' reported blended learning practice.

The readiness regression had $R^2 = .370$, while Model 1 for self-reported practice had $R^2 = .412$. After readiness was entered, the model explained 47.8% of the variation in reported practice, while the other four predictors remained statistically significant. This suggests that perceived preparedness captures something beyond the teacher-level capabilities and support conditions already included, but the cross-sectional results do not show that these factors operate in a causal order.

For vocational colleges, the findings provide initial empirical support for considering teacher capabilities, attitudes and perceived support together. Subject-focused professional learning, shared content development and clearer service pathways may be worth piloting, but their effects require direct evaluation with longitudinal, multi-source and institution-aware designs.

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