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Research on the Situation of Educational Digital Transformation of Rural English Teachers in Hunan Province from the Perspective of Self-Determination

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Abstract: With the advancement of educational digitalization, the digital literacy of rural teachers has become a crucial factor influencing the high-quality development of education. Based on Self-Determination Theory, this study investigates the current situation of educational digital transformation among rural English teachers in Hunan Province. A questionnaire survey was conducted with 371 teachers from 14 prefecture-level cities. The findings reveal that teachers' overall digital literacy is at an upper-medium level. The dimension of ethical responsibility scored the highest, indicating that teachers have a full understanding of the normative nature of digital ethics; the autonomy dimension is at a relatively high level, but there is an imbalance between cognition and action internally; the scores of the support environment dimension, application ability dimension, and knowledge and skills dimension are relatively low, reflecting insufficient competence and sense of belonging. Drawing on the three core needs of autonomy, competence, and relatedness in Self-Determination Theory, this study comprehensively proposes three improvement paths: encouraging teachers to participate in the planning of changes and digital innovation, scientifically designing training content and developing local resources for English teaching, and enhancing emotional support and the fit of rural teachers' identities. The aim is to stimulate teachers' intrinsic motivation and facilitate their digital transformation, providing theoretical insights and practical references for the development of rural teacher teams.

Keywords: Self-Determination; rural English teachers; educational digital transformation; digital literacy; Hunan Province

Ⅰ. Introduction

With the rapid development of digital technology, the field of education is undergoing profound and unprecedented changes. Digital technology has not only reshaped teaching content and methods but also imposed higher demands on teachers' professional competencies. In 2022, China's Ministry of Education officially promulgated *The Education Industry Standard of Digital Literacy of Teachers*, which clarifies the core competencies required of teachers in terms of digital awareness, knowledge and skills, application capabilities, social responsibility, and professional development[i]. At the same time, *Compulsory Education's English Curriculum Standards* (2022 Edition) explicitly states that modern digital technology should be fully utilized to promote the deep integration of information technology and English teaching[ii]. It is evident that digital literacy has become a core component of teachers' professional development. Particularly in the context of rural education, it is a vital pathway to narrow the urban-rural education gap and achieve educational equity by enhancing teachers' digital literacy[iii].

However, rural teachers currently face numerous practical difficulties in the process of digital transformation. Although hardware conditions have gradually improved, teachers' application abilities in digital teaching remain weak, and issues such as insufficient learning motivation and limited practical initiative have become increasingly prominent. How to stimulate teachers' intrinsic motivation and encourage their active participation in digital teaching practice has become a critical issue that needs to be addressed.

Self-Determination Theory emphasizes that individuals' intrinsic motivation stems from the satisfaction of three basic psychological needs including autonomy, competence, and relatedness. This theory provides a new analytical perspective for understanding the internal drivers of teachers' digital literacy development. Based on this theoretical framework, this study takes rural English teachers in Hunan Province as the research object. Centering on the three core needs of Self-Determination Theory and integrating the standards of teacher digital literacy with the core competencies of the English subject, this study adopts a questionnaire survey to systematically investigate the current situation and problems in their educational digital transformation. It analyzes the differences and interrelations among various dimensions. And on this basis, it proposes practical pathways to promote the enhancement of teachers' digital literacy, aiming to provide theoretical support and practical reference for the construction of rural teacher teams and the advancement of educational digital transformation.

Ⅱ. Theoretical Framework

2.1 The Connotation of Self-Determination Theory

Self-Determination Theory (SDT) was proposed by American psychologists Edward L. Deci and Richard M. Ryan in the 1980s. It posits that the needs for autonomy, competence and relatedness constitute three fundamental intrinsic

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psychological needs. Among them, the need for autonomy emphasizes the individual's sense of autonomy and willingness when doing something; the need for competence is the individual's sense of competence in completing a certain activity, feeling that they have the ability to complete it; the need for belonging refers to the individual's need to belong to a certain group, hoping to receive support and understanding from others, and longing to integrate into the group[iv]. At the same time, these three basic psychological needs are innate to humans and have universality across different cultures, races, and regions.

Ryan and Stiller believe that the three basic psychological needs influence and interact with each other[v]. Specifically speaking, the satisfaction of the need for belonging can provide security support for the need for autonomy, the satisfaction of the need for autonomy helps to form the satisfaction of the need for competence, and the satisfaction of the need for competence also makes individuals perceive importance and create benefits for others to a certain extent, which is conducive to the realization of the need for belonging. The satisfaction of these three needs facilitates the generation of intrinsic motivation in individuals during their engagement in activities, and the degree of internalization of external demands, values and rules largely depends on the extent to which individuals experience the fulfillment of their psychological needs in the process of activities[vi].

Self-determination theory emphasizes that each individual has an inherent need for continuous positive development, which is an innate and spontaneous essential need with their free choice of their own behaviors and preference to the tasks they are willing to complete with more efforts. Plus, human beings are apt to satisfy their instinctive curiosity and interest in new things to subsequently meet their desire for more self-development and success. Here what must be pointed out that the information provided by the social environment always plays a decisive role in individuals' recognition of their true intrinsic needs[vii].

2.2 Interpretation of Digital Literacy of Teachers and the Imperative for Rural English Teachers' Transformation

The Education Industry Standard of Digital Literacy of Teachers(2022) states that digital literacy for teachers refers to their digital awareness, technology knowledge and skills, digital ability, digital social responsibility and professional development that teachers possess to transform educational and teaching activities appropriately with digital technologies[1]. Based on this, many experts and scholars have conducted in-depth interpretations of the connotation and standards of teachers' digital literacy. Among them, Wu et al. (2023) have provided a detailed interpretation from the five dimensions of teachers' digital literacy. They pointed out that digital awareness is the basic awareness that teachers should have in the application of digital technology in education and teaching. Digital technology knowledge and skills are the solid foundation for teachers' digital teaching. Digital applications reflect teachers' comprehensive ability to use digital technology. Digital social responsibility is the moral requirement for teachers in the digital age. Professional development is the ability of teachers to keep up with the times, and promote their own continuous development by leveraging digital technology and resources[viii].

This standard not only indicates the direction of development but also provides a basis for evaluating the current digitalization level of the teaching force. Especially for rural English teachers, educational digitalization has become a national strategy. Curriculum delivery experienced a fundamental change because of digital technology adoption in education while teachers must achieve advanced digital literacy and practice innovative pedagogy[ix], and *Compulsory Education's English Curriculum Standards* (2022 Edition) also explicitly requires that the English curriculum should attach importance to the change of teaching mode and learning style under modern digital technology and full use of information and technology with the goal of promoting the deep integration of information technology and course instruction[2]. This means that digital capabilities are no longer an option but a compulsory course. Enhancing the digital literacy of rural teachers is the key to promoting high-quality development of rural education and narrowing the gap between urban and rural education. The professional level of rural teachers directly affects teaching quality. If their digital literacy lags behind for a long time, the "access gap" brought about by the improvement of hardware conditions may further transform into a "capability gap" in teaching quality, putting rural students at an even more disadvantaged position in the cultivation of language skills and global perspectives.

Therefore, the unique challenges and developmental needs of rural education are prompting rural English educators to accelerate their transition from traditional teaching roles to designers and facilitators of digital learning environments, thereby injecting a sense of urgency into their digital transformation.

2.3 The Appropriateness of Applying Self-Determination Theory to Analyze the Digital Transformation of Rural English Teachers in Hunan Province

Amissah (2024) proves digital literacy stands as a key factor which influences the teaching capacity to execute new educational material effectively[x]. However, during the critical period of digital transformation in rural education, although digital literacy of teachers has become a core element driving a leap in educational quality, the current development strategies mostly focus on optimizing external conditions such as hardware construction and policy promotion, while paying insufficient attention to how to stimulate teachers' learning motivation by meeting their intrinsic psychological needs. Many rural teachers experiencing a lack of learning motivation and a superficial learning process, the absence of these intrinsic motivations is increasingly becoming a major factor restricting their digital transformation[xi].

Here comes the self-determination theory which is chosen as the theoretical basis because it is a relatively complete and mature theory system for motivation and personality. It distinguishes and explains intrinsic and extrinsic motivations, emphasizing the role and dialectical relationship of internal psychology and external environment in human cognition and individual difference development. Specifically speaking, when the external environment support can meet the basic psychological needs of individuals, individuals will internalize external rules and values to form internal autonomous motivations, that is, a higher degree of self-determination. On the contrary, when the external environment support does

not match or meet the basic psychological needs, then a motivation controlled by the external world will not be effectively generated, and the degree of self-determination of the behavior is also lower. During this process, the self-determination potential of the individual helps to promote or enhance the participation of individuals in positive development activities, thereby promoting the generation and formation of intrinsic motivations. The satisfaction of an individual's basic psychological needs including autonomy, competence, and belonging, has a key motivating effect on their enthusiasm, sense of will, and willpower. This can be manifested in individual creativity, perseverance, willpower, etc[xii].

Ⅲ. Research Design

3.1 Research Sample and Data Collection

This study takes rural English teachers in Hunan Province as the research subjects and aims to understand the current state of their educational digital transformation from the perspective of self-determination theory. To ensure the coverage and diversity of the sample, a multi-stage convenience sampling method was adopted. Questionnaires were distributed through an online survey platform, and the data collection was conducted throughout October 2025, lasting one month, yielding 371 valid responses. The sample covers all 14 prefecture-level cities in Hunan Province. This comprehensive geographical coverage ensured representative sampling and reinforced the authenticity and validity of the survey data.

Table 1 Basic Information of Sample Objects（N=371）

Category	Option	Number	Percentage
Gender	Male	86	23.18%
	Female	285	76.82%
Age	Within 30 years old	183	49.33%
	31 - 40 years old	94	25.34%
	41 - 50 years old	42	11.32%
	51 - 63 years old	52	14.01%
Education	Associate degree	43	11.59%
	Bachelor's degree	326	87.87%
	Master's degree	2	0.54%
	Doctoral degree	0	0%
Professional Title	Third-level teacher	57	15.36%
	Second-level teacher	144	38.81%
	First-level teacher	122	32.89%
	Senior teacher	46	12.40%
	Professor-level senior teacher	2	0.54%

3.2 Research Instruments

This study employed the questionnaire survey method. Based on relevant national policy documents on educational digital transformation and existing literature, combined with the actual working context of rural teachers, the questionnaire was designed to comprehensively examine the current status of rural English teachers' digital transformation from the perspective of Self-Determination Theory.

The questionnaire consists of three parts with a total of 29 items. The first part covers four demographic variables, including gender, age, educational background, and professional title, which are used to analyze the differences in digital transformation among teachers with different backgrounds. The second part investigates the current status using a 4-point Likert scale (1=strongly disagree, 2=disagree, 3=basically agree, 4=strongly agree), covering five core dimensions with a combination of three psychological needs. Among them, the dimension of digital awareness and value recognition includes 4 items, examining teachers' level of cognition, value recognition, and willingness regarding digital transformation in education which is a reflection of autonomy; the dimension of digital technology knowledge and skills includes 3 items, one of which autonomy and competence is described, examining teachers' mastery of digital technology and the usage methods and operational abilities of digital devices and platforms; the dimension of digital teaching status includes 10 items, all of which are description of competence covering digital assessment tool application, digital textbook usage, teaching resource creation, blended teaching, data analysis and visualization, and integration of ideological and political education in the curriculum, systematically presenting teachers' application levels of digital technology in teaching practice; the dimension of digital ethics status includes 4 items in answer to competence and belonging, examining teachers' awareness and behaviors regarding compliance with internet laws and regulations, protection of intellectual property rights, management of privacy data, and prevention of cyber risks; the dimension of teacher professional development status includes 2 items referring to belonging, examining teachers' initiative in participating in digital training and online professional development activities such as virtual teaching research offices, as well as their ability to apply what they have learned. The third part concerns practical difficulties and needs, using 2 multiple-choice questions to investigate the main difficulties teachers face in digital teaching practice and the directions of training support they expect to receive.

3.3 Validity and Reliability Testing

To ensure the scientific nature and reliability of the questionnaire, this study conducted a systematic examination of reliability and validity. In terms of reliability, the Cronbach's α coefficient was used to test the internal consistency of the total scale, yielding a Cronbach's α coefficient of 0.866, which reaches the standard of above 0.80, indicating that the

questionnaire possesses good internal consistency reliability.

In terms of validity, this study verified the construct validity. Construct validity was examined using exploratory factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.941, and Bartlett's test of sphericity reached a significant level ($p < 0.001$), indicating that the data were suitable for factor analysis. Factors were extracted through principal component analysis with varimax rotation. The extracted factor structure was basically consistent with the presumed dimensions, and the loadings of all items on their respective factors met statistical requirements, indicating that the questionnaire possesses good construct validity.

Table 2 Reliability Analysis

Items	Samples	Cronbachα
24	371	0.967

Table 3 Validity Analysis

	KMO	0.877
	Pearson Chi-Square	3109.438
Bartlett's Test of Sphericity	*Degrees of Freedom (df)*	276
	p	0

Thus, the questionnaire meets statistical standards in terms of internal consistency reliability and construct validity, and can serve as a reliable and valid measurement instrument for this study, providing a solid methodological foundation for subsequent data analysis and research conclusions.

3.4 Research Result

The study employs a self-designed questionnaire as the research instrument, based on the framework of teacher digital literacy standards. The questionnaire consists of 27 Likert-scale items and 2 open-ended questions, covering five dimensions: development awareness and agency, knowledge and skills, application capabilities, ethical responsibilities, and supportive environment. Grounded in Self-Determination Theory, the research content focuses on the multi-dimensional status description of rural English teachers' digital literacy. And in this framework, development awareness and agency correspond to the need for autonomy; knowledge and skills, along with application abilities, correspond to the need for competence; and the supportive environment corresponds to the need for relatedness. Ethical responsibility, meanwhile, is the result of the interplay between relatedness and internalized regulation..

In terms of overall level, the total digital literacy scores of 371 surveyed respondents range from 24 to 96, with a mean score of 76.11 and a standard deviation of 13.62. According to the score classification, 46 teachers are at low level (below 60 points), accounting for 12.4%; 186 teachers are at medium level (60-79 points), accounting for 50.1%; and 139 teachers are at high level (80 points and above), accounting for 37.5%. In terms of dimension scores, the ethical responsibility dimension ranks highest with an average score of 3.52 (out of 4.0), followed by the autonomy dimension with 3.29, the supportive environment dimension with 3.18, the application capability dimension with 3.03, and the knowledge and skills dimension with 3.01, indicating the relative weakness of the competence dimension.

Table 4: Scores of Digital Literacy Dimensions of Rural English Teachers in Hunan Province

Dimension	Number of Items	Mean Score (Maximum)	Score Rate
Ethical Responsibility	4	3.52 (4.0)	88.00%
Development Awareness & Agency	4	3.29 (4.0)	82.25%
Supportive Environment	2	3.18 (4.0)	79.50%
Application Capability	10	3.03 (4.0)	75.75%
Knowledge & Skills	3	3.01 (4.0)	75.25%

Regarding dimension-specific descriptions, the dimension of development awareness and agency comprises three aspects: cognition of the importance of digital technology, willingness to transform, and initiative. Item 5 "Understanding the important role of digital technology in the development of digital society, especially in the digital transformation of education" and Item 6 "Being aware that digital technology resources have put forward new requirements for teaching theories, models, and methods of the subject taught, and being willing to realize personal digital transformation of teaching" score relatively high (3.36 and 3.37 respectively), indicating that rural English teachers are relatively adequate at the cognitive level of digitalization. However, Item 8 "Overcoming difficulties and challenges in digital technology resource use and teaching method innovation, and persisting in continuous exploration of digital education and teaching practice" scores relatively low (3.17), reflecting insufficient practical agency.

The knowledge and skills dimension examines the mastery of digital technology knowledge. Item 9 "Understanding the connotative characteristics of multimedia, Internet, big data, virtual reality, and artificial intelligence, as well as their

procedures and methods for solving problems" scores 3.02, and Item 11 "Proficiently operating and using the above digital resources and technologies, and solving common problems" scores 2.98, both between "basically conforms" and "does not conform," indicating relatively weak knowledge foundations.

The application capability dimension covers 10 aspects including instructional design, resource integration, and evaluation feedback. Among them, Item 12 "Using appropriate digital evaluation tools (such as Class Butler) to analyze students' learning abilities, effects, and styles" scores 2.96, Item 13 "Fully utilizing digital textbooks (such as 'Smart Fun New Classroom' developed by Hunan Province) to enrich teaching resources and make classroom teaching resources more vivid" scores 2.95, and Item 20 "Using visualization tools such as charts and heat maps and online tools such as Deepseek to analyze the distribution of student grades, learning performance, etc., so as to adjust education management strategies in a timely manner" scores 2.93. These three items have the lowest scores in the application capability dimension, highlighting the shortcoming in data analysis and evaluation tool application capabilities.

The ethical responsibility dimension examines teachers' ethical responsibilities towards students and the profession. The score of 3.57 for question 24, "Manage and protect the information and privacy data of teachers, students, and parents well," indicates a strong sense of belonging among teachers towards students. The scores of 3.16 and 3.20 for questions 26, "Actively participate in professional development learning activities supported by digital technology resources," and 27, "Participate in digital teaching training and apply what is learned to teaching practice," respectively, reflect a relatively weak sense of belonging among teachers towards the professional community.

The support environment dimension examines the situation of teachers' participation in external support. The scores of questions 26 and 27 indicate that the participation of teachers in professional development activities and training needs to be improved.

The statistical results of open-ended questions further reveal the specific difficulties and training needs of rural English teachers. In Question 28 "What are the main difficulties you encounter in digital teaching of the subject you teach?", students' insufficient information technology application capability (238 times), insufficient proficiency in operating digital tools (220 times), uneven quality of resources (203 times), insufficient digital equipment in schools (215 times), and lack of relevant training (174 times) are the main types of difficulties. In Question 29 "In what aspects do you hope to receive further support or training?", the use of digital tools (286 times), screening and integration of digital resources (245 times), improvement of instructional design capability (226 times), and personalized teaching strategies (212 times) are the main directions of training needs. Regarding group differences among demographic variables such as gender, age, and professional title, through independent samples t-test and one-way ANOVA, there are no statistically significant differences in total digital literacy scores among teachers of different genders ($t=0.344$, $p=0.731$), different ages ($F=2.107$, $p=0.099$), and different professional titles ($F=0.890$, $p=0.470$).

In summary, the digital literacy of rural English teachers in Hunan Province is at a medium-to-upper level overall, with unbalanced development across dimensions. Ethical responsibility and autonomy perform well, while knowledge and skills and application capabilities are relatively weak, especially with obvious shortcomings in data analysis and evaluation tool application capabilities. The main difficulties teachers face in the process of digital transformation focus on students' insufficient information technology capability, insufficient proficiency in operating digital tools, uneven quality of resources, etc., and there is strong demand for training in the use of digital tools, screening and integration of resources, improvement of instructional design capability, etc. There are no significant differences in digital literacy levels among different groups, indicating that digital literacy problems are universal and require systematic support and intervention.

Ⅳ. Description and Analysis of Actual Competency Levels Based on Self-Determination Theory

Based on the three core needs of self-determination theory, rural English teachers' digital literacy presents structural characteristics of positive cognition but insufficient practice. Overall, the ethical responsibility dimension scores highest, indicating teachers have a solid normative understanding of digital ethics. The autonomy dimension is at a relatively high level but has internal imbalances between cognition and action. The support environment, application ability, and knowledge skills dimensions score relatively low, reflecting shortcomings in competence and external support.

4.1 Disconnect Between Development Awareness and Practical Initiative

From the data perspective, the overall score of the Autonomy Dimension is 3.29 (out of 4.0), which is at a relatively high level, but there are significant cognition-action differences internally. Among them, teachers' cognition of the important significance of digital technology in educational digital transformation (Item 5, 3.36) and their awareness of new requirements for teaching by digital technology resources and willingness to realize digital transformation (Item 6, 3.37) both show relatively high levels, indicating that rural English teachers hold a positive recognition attitude towards digital transformation at the cognitive level. However, in the practical agency dimension, teachers' score for overcoming difficulties and challenges in digital practice and continuously carrying out digital teaching exploration is only 3.17, significantly lower than the cognitive dimension score, and a certain proportion of teachers choose the options of "disagree" or "strongly disagree".

This disconnection between cognition and action forms a practical dilemma of "knowing but not acting", reflecting the structural contradiction between development awareness and practical agency of rural English teachers in digital transformation. Positive recognition at the cognitive level has not been effectively transformed into teaching practice behaviors. The underlying reasons may include limited opportunities for digital teaching practice in rural schools, lack of demonstration and leading mechanisms, and insufficient self-efficacy of teachers[xiii]. Although teachers can recognize the importance of digital transformation, it is difficult for them to cross the gap from willingness to action in specific teaching

situations, resulting in digital development staying at the awareness level and failing to have a substantial impact on teaching practice. This phenomenon further confirms that the satisfaction of autonomy needs in Self-Determination Theory requires not only cognitive recognition but also practical support and guarantee.

4.2 Dual Challenges in Knowledge Skills and Application Ability

Data shows that the scores of the Knowledge and Skills Dimension and Application Capability Dimension are 3.01 and 3.03 respectively, which are at the lowest levels among the five dimensions, forming a structural shortboard of digital literacy for rural English teachers. In the Knowledge and Skills Dimension, teachers' understanding of the connotative characteristics of emerging digital technologies such as multimedia, big data, virtual reality, and artificial intelligence scores only 3.02, and their operational skills for digital devices, software, and platforms score 2.98, both at the critical state between "basically conform" and "disagree". In the Application Capability Dimension, teachers' abilities to use digital evaluation tools to analyze students' learning (Item 12, 2.96), use digital textbooks to enrich teaching resources (Item 13, 2.95), and use visualization tools to analyze the distribution of students' scores (Item 20, 2.93) score the lowest, reflecting significant deficiencies in data-driven teaching capabilities.

This dual challenge of knowledge skills and application capabilities forms a competence dilemma for rural English teachers in digital teaching. Teachers not only lack theoretical knowledge and operational skills of digital technology but also find it difficult to effectively apply existing technology to English teaching practice, forming a vicious circle where insufficient knowledge reserve and limited application capabilities restrict each other. The insufficient understanding of emerging technologies such as artificial intelligence and big data makes it difficult for teachers to make full use of various tools to create digital teaching resources or carry out teaching effect analysis; while the lack of practical opportunities in turn restricts teachers' in-depth understanding of digital technology, further weakening the improvement of application capabilities. This structural dilemma not only affects the quality improvement of rural English teaching but also restricts the space for teachers' own professional development.

4.3 Need for Improvement in Sense of Belonging and Support Environment

The score of the Ethical Responsibility Dimension is 3.52, indicating that rural English teachers have a strong sense of belonging to students. Among them, the score for protecting the information and privacy data of teachers, students, and parents is as high as 3.57, reflecting teachers' high sense of responsibility and ethical awareness towards students. However, in terms of sense of belonging to professional community, teachers' scores for actively participating in professional development activities supported by digital technology (Item 26, 3.16) and applying what they have learned in training to teaching practice (Item 27, 3.20) are relatively low, reflecting teachers' insufficient sense of belonging to professional community. The score of the Supportive Environment Dimension is 3.18, and teachers generally believe that the lack of relevant training is the main difficulty in digital teaching, and they have strong demand for training in the use of digital tools, screening and integration of digital resources, improvement of instructional design capabilities, etc.

The insufficiency of sense of belonging and supportive environment interact to form external constraints on the digital transformation of rural English teachers. Teachers' weak sense of belonging to professional community leads to their low willingness to actively seek external support; while the lack of external support further weakens teachers' recognition of professional community, forming a vicious circle. This phenomenon reflects that the satisfaction of belonging needs in Self-Determination Theory requires not only the efforts of individual teachers but also the construction of a sound support system by schools and education management departments, including providing systematic professional development opportunities, establishing effective demonstration and leading mechanisms, and creating a cultural atmosphere that encourages innovation. Only when teachers feel support and recognition from the professional community can they better overcome difficulties in the transformation process and enhance their sense of belonging and recognition of digital teaching.

Ⅴ. Promotion Paths Based on Self-Determination Theory

Aiming at the problems faced by rural English teachers in Hunan Province during digital transformation, such as the disconnect between development awareness and practical initiative, dual challenges in knowledge skills and application ability, and insufficient sense of belonging and support environment, this study comprehensively proposes three promotion paths based on the three core needs of self-determination theory: autonomy, competence, and sense of belonging. These three paths are mutually supportive, aiming to systematically meet teachers' psychological needs, effectively enhance their digital identity recognition, and facilitate the digital transformation of rural English teachers in Hunan Province.

5.1 Encourage Teacher Participation in Reform Planning and Digital Innovation

Rural English teachers experience a disconnect between their awareness of professional development and practical agency during digital transformation. Their positive cognitive endorsement has not been effectively translated into teaching practices. The primary reason lies in teachers' lack of opportunities for autonomous participation and practical support during the reform process. Data analysis from the autonomy dimension shows that teachers have a relatively high level of cognitive understanding of digital transformation, but their practical agency is insufficient. This reflects that teachers' subjectivity has not been fully exerted during the transformation process, leading to a practical dilemma of "knowing but not acting."

In light of this situation, the core path to meeting teachers' autonomy needs lies in encouraging them to deeply participate in reform planning and digital innovation. Self-determination theory emphasizes that when individuals can autonomously participate in decision-making processes, their intrinsic motivation and persistence increase significantly[6]. Schools should establish a participation mechanism for teachers in digital transformation, inviting them to be involved in the

formulation of the school's digital teaching planning process, making teachers the designers and promoters of digital transformation rather than passive executors. For instance, in the "Digital Smart Teacher" initiative in Changsha, Hunan Province, a "U-G-C-S" teacher training model was constructed, involving universities, the government, teacher development communities, and pilot schools, allowing teachers to deeply participate in the planning and implementation of teaching, research, and training activities, effectively stimulating their autonomous initiative[xiv]. At the same time, schools can enrich teachers' vicarious experiences by building digital learning communities, thereby enhancing their self-efficacy and digital literacy. Firstly, by showcasing successful case studies, teachers are inspired in the process of observing others' experiences, creating a chain reaction that promotes more teaching innovation practices. Secondly, through online platforms that support synchronous interaction, organize interactive learning activities such as seminars and workshops, allowing teachers to deepen their understanding and application of digital technology under the guidance of experts or experienced teachers. Finally, by establishing a paired assistance system, use intelligent matching systems to provide personalized guidance for teachers, stimulating their intrinsic development motivation. Additionally, schools should create digital teaching practice opportunities, encouraging teachers to apply digital technology in daily teaching, and affirm and reward their proactive exploration and innovative practices in digital transformation, creating a culture of tolerance for mistakes and encouragement of innovation. Such a supportive environment can effectively enhance teachers' self-efficacy and facilitate their transition from cognition to action[xv].

5.2 Scientifically Design Training Content and Develop Local English Teaching Resources

Rural English teachers exhibit structural deficiencies in digital literacy competencies, with low scores in both the knowledge and skills domain and the application proficiency domain. They lack both theoretical knowledge and practical skills related to digital technologies and struggle to effectively apply these technologies in English teaching practices, creating a vicious cycle of insufficient knowledge reserves and limited application capabilities. Data analysis shows that teachers have insufficient understanding of the connotation and characteristics of emerging digital technologies, weak operational skills of digital resources, and particularly a significant deficiency in data-driven teaching ability.

To address this dual predicament, efforts should be made from two aspects: the reconstruction of the training system and the construction of resources. The training content should be scientifically designed and local resources for English teaching should be developed. The design of training content should follow the principle of progressive stratification, providing differentiated training programs for teachers with different bases and needs. The theory of teachers' professional development stages indicates that teachers' professional growth shows distinct phased characteristics, and teachers at different growth stages have significant differences in core development concerns, ability shortcomings, and learning demands[xvi]. Li (2026) further proposed that teacher training should be based on the growth process of novice teachers, competent teachers, backbone teachers, outstanding teachers, and educational expert teachers, and construct a modular curriculum system of "progressive stratification and supply based on demand"[xvii]. Drawing on the "three-stage progressive" training model of Wuhu City, the training can be divided into the basic literacy layer, the subject application layer, and the innovative practice layer: the basic layer focuses on the operation of digital tools and the cultivation of digital literacy, solving the problem of "knowing how to use"; the subject application layer emphasizes the deep integration of digital technology and English teaching, cultivating the ability of "skilled use"; the innovation layer encourages teachers to carry out cross-disciplinary teaching and educational model innovation, achieving the breakthrough of "flexible use"[xviii]. The teacher's blended research and training model centered on collaborative knowledge construction constructed by Ma et al. (2018) indicates that blended research and training can effectively promote the improvement of teachers' theoretical and practical knowledge. Through three stages of preparation, face-to-face research and training, and remote online research and training, it realizes the unification of individual knowledge construction and group knowledge construction[xix]. At the same time, relying on the Hunan Province Smart Education Platform, Xiangjiao Cloud and other platform resources, and in combination with the actual situation of rural English teaching, digital teaching resources that are close to the life of rural students and reflect regional cultural characteristics should be developed. Quan et al.(2024) emphasized that rural teachers should have the ability to adapt to local curriculum development, explore local natural and human resources, and deeply integrate local knowledge with subject teaching[xx]. A resource development team for rural English teachers can be established, with teachers jointly participating in the selection, integration, and creation of resources. In the process of resource development, teachers' digital technology application capabilities can be enhanced, and at the same time, a localized resource library suitable for rural English teaching can be developed.

5.3 Improve Emotional Support and Rural Teacher Identity Fit

Rural English teachers face a structural paradox in terms of their sense of belonging. They have a strong sense of connection to their students but a weak sense of belonging to the professional learning community, demonstrating low enthusiasm for participating in training and professional development activities. Teachers generally believe that the lack of relevant training is the main difficulty in digital teaching, and they have a strong demand for training in the use of digital tools, the screening and integration of resources, and the improvement of teaching design skills. This reflects a situation where the lack of external support and the weakness of teachers' sense of belonging are mutually restrictive.

To address the dual deficiencies in sense of belonging and support environment, it is necessary to build a comprehensive emotional support system and identity recognition mechanism to enhance the identity fit of rural teachers. Skaalvik et al. (2025) have shown that when teachers feel supported and recognized by the school and colleagues, and share educational values with the school, their professional belonging and job satisfaction will significantly increase[xxi]. Schools should pay attention to teachers' work pressure and emotional needs, provide necessary psychological support and emotional care for teachers, and help them alleviate anxiety and frustration during the digital transformation process. At the same time, it is

advisable to strengthen the construction of professional communities and learning communities, create an atmosphere of mutual support and common growth among teachers, and promote emotional communication and mutual support among teachers. Schools can also listen to teachers' voices and needs through regular teacher symposiums and feedback meetings, and promptly solve problems they encounter in work and life. In addition, creating a good atmosphere of digital collaborative education is also a key practical path to enhance the identity fit of rural teachers. A good atmosphere of digital collaborative education can reduce teachers' workload and provide a supportive space. Specifically, schools should encourage effective use of digital tools by teachers both inside and outside the school, as well as between schools and enterprises, and between schools and families, such as online education platforms, virtual classrooms, and interactive communication software, to carry out online collaborative education work[xxii], thereby promoting professional communication and cooperation among teachers, deepening the depth and breadth of school-enterprise cooperation, enhancing communication and understanding between schools and families, and helping teachers better adapt to the new mechanisms of education in the digital age.

Ⅵ. Conclusion

Rural English teachers have been playing indispensable role in talent cultivation for China's rural recapitalization, especially in the time of nationally digital transformation. Their needs for development must be notified and answered. Full attention should be paid to the structural feature of positivity at the cognitive level but inadequacy at the practical level. This dilemma can only be solved in both the external, that is support from schools, governments and even students, and the internal drives by meeting their needs for autonomy, competence and belonging to improve their self-determination behaviors to do better in digital transformation.

However, there are inevitably some limitations, such as the small sample size, short experiment time and data collection and analysis.

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REFERENCES

[i] Ministry of Education of the People's Republic of China. *Notice of the Ministry of Education on Releasing the Educational Industry Standard 'Teacher Digital Literacy*[EB/OL].(2022-12-02) [2026-4-28]. https://www.moe.gov.cn/srcsite/A16/s3342/202302/t20230214_1044634.html

[ii] Ministry of Education of the People's Republic of China.*Notice of the Ministry of Education on Printing and Distributing the Compulsory Education Curriculum Plan and Curriculum Standards (2022 Edition)*[EB/OL].(2022-04-08) [2026-4-28]. http://www.moe.gov.cn/srcsite/A26/s8001/202204/t20220420_619921.html

[iii] H. Zhang, J. Wu, Y. Liu, et al.The 'Digital Divide' in Urban and Rural Basic Education: Characterization, Causes and Solutions:An Empirical Study Based on Online Teaching[J]. *Education and Economy*, 2021(04): 20–28.

[iv] J. Dong.*An experimental study on the influence of autonomous exercise on exercise behavior and adherence in obese adults*[D]. Xi'an, China: Xi'an Physical Education University, 2019.

[v] M. L. Maehr and P. R. Pintrich, Eds.*Advances in Motivation and Achievement*[M]. Greenwich, CT, USA: JAI Press, 1991.

[vi] R. M. Ryan,E. L. Deci. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being[M]. *American Psychologist*,2000(01): 68–78.

[vii] E. L. Deci , R. M. Ryan. *Intrinsic Motivation and Self-Determination in Human Behavior*[M]. Boston, MA, USA: Springer, 1985.

[viii] K. Wu, X. Gui, C. Zhou, et al.Teacher digital literacy: Connotation, standards and evaluation[J]. *Journal of Educational Technology*, 2023(08):108–114+ 128 .

[ix] A. Gruszczynska, G. Merchant & R. Pountney. Digital futures in teacher education[J]. *Electronic Journal of e-Learning*, 2013(03):193–206 .

[x] P. B. Amissah. *Digital literacy skills as a determinant of teacher's preparedness to use the 2019 curriculum: A case of basic school teachers in Cape Coast metropolis*[D].Cape Coast, Ghana:University of Cape Coast,2023.

[xi] Q. Yang.*The value implications, realistic dilemmas and breakthrough paths of improving rural teachers' digital literacy in the digital context*[J]. Cultural and Educational Materials, 2024(07):187–189+193,.

[xii]. R. M. Ryan , E. L. Deci. Intrinsic and extrinsic motivations: Classic definitions and new directions[J]. *Contemporary Educational Psychology*, 2000(01):54–67.

[xiii] J. He, X. Wang, Y. Li. Research on teacher agency: Connotation, influencing factors, effects and enhancement strategies[J]. *Journal of Anshun University*, 2025(04):62–67.

[xiv]Ministry of Education of the People's Republic of China. Changsha City, Hunan Province takes multiple measures to promote digital and intelligent teacher development[EB/OL]. (2025-09-16)[2026-03-26].https://www.moe.gov.cn/jyb_xwfb/s6192/s222/moe_1750/202509/t20250916_1413597.html

[xv]W. Wang, Z. Wei. Self-efficacy: The intrinsic motivation for improving teachers' digital literacy[J]. *Journal of Xingtai University*, 2026(03) :1–10.

[xvi]L. Zhang. A review of theoretical research on teacher professional development stages[J]. *Journal of Innovation and Entrepreneurship Theory and Practice*, 2018(22): 22–23.

[xvii] F. Li. Subject ability stratification of teacher training and optimization of curriculum adaptation structure[J].*Primary and Secondary School Teacher Training*, 2026(01):1–6 .

[xviii]Y. Guan, H. Zhang & X. Guan. Research on the path of improving teachers' teaching ability under the background of digital transformation[EB/OL]. (2025-12-25)[2026-04-28]. https://szjj.china.com.cn/2025-12/25/content_43318501.html

[xix]. N. Ma, Z. Cui & M. Zeng. Research on the effect of teacher blended training based on collaborative knowledge building—A content analysis methods[J].*China Educational Technology*,2018(09):117–122+131.

[xx]. X. Quan, Q. Cai. A culturally responsive reflection on rural teachers' professional development:Towards cultural understanding, reflection and practices[J].*Educational Research*, 2024(04):84–95.

[xxi]. M. E. Skaalvik, S. Skaalvik. Shared values in the teaching profession: A study of relations with perceived social support, job satisfaction, engagement, and sense of belongings[J]. *Creative Education*, 2025(04):571–588 .

[xxii]. Y. Du, Q. Huang.How to improve primary and secondary school teachers' digital literacy: An empirical study based on survey data of primary and secondary school teachers in X Province and Y Provinces[J]. *Educational Research and Experiment*, 2021(04): 62–69.