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A Closed-Loop "Assessment-Training-Research-Implementation" Model for Enhancing University EFL Teachers' Digital Literacy: A School-Based Study

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Abstract: Against the dual background of New Liberal Arts construction and educational digital transformation, conventional teacher training usually emphasizes lectures over diagnosis, uniform instruction over stratified strategies, and training delivery over practical transfer, lacking a system connecting diagnosis, learning, practice and reflection together and making it difficult to achieve systematic and school-based improvement. To address this gap, this study draws on Teacher Professional Development, Action Research and Community of Practice to construct a, closed-loop model for the school-based improvement of university EFL teachers' digital literacy, namely "assessment – training – research - implementation". A one-year action research was conducted in the school of foreign languages of a local university through questionnaires, interviews, case studies and classroom observations. Results show significant improvement of participating teachers' digital literacy across technical operation, teaching integration, digital ethics, and AI application. Teachers also turn from knowledge transmitters to learning designers, guides, and AI collaborators. This model provides an operational path for the systematic and school-based improvement of university EFL teachers' digital literacy and can be further extended to other disciplines and institutions.

Keywords: Digital literacy; University EFL teacher; Assessment – training – research - implementation; Teacher professional development

1. Introduction

1.1 Research Background

At present, China's higher education is further promoting the construction of the New Liberal Arts, which requires breaking down the traditional disciplinary barriers and empowering liberal arts education with modern information technology. In essence, it is to promote the digital transformation of liberal arts education. As a fundamental link in the humanistic education and international talent cultivation of universities, university EFL teaching must reshape its teaching models, course forms, and even the structure of teachers' professional competence. The traditional EFL teaching centering on "teacher lectures + textbook texts" can no longer meet the demand of compound-type, innovative talents with intercultural communication competence the new era calls for.

At the same time, national strategy on educational digitalization provides a clear policy orientation for this transformation. In April 2025, Opinions on Accelerating the Digitalization of Education, issued by the Ministry of Education and Nine Other Departments clearly stated that it is necessary to enhance the digital literacy and skills of the whole population with teachers and students as the priority [1], formulate and improve standards for digital literacy of teachers and students and guidelines for the application of artificial intelligence, and integrate digital literacy into teacher training system. It suggests that teachers' digital literacy is no longer confined to personal technology competence. It has now evolved into a human resource foundation at the national strategic level and stands as a key indicator for educational modernization.

The more direct driving force stems from the rapid development and widespread of artificial intelligence technology, especially large language models. Large models represented by DeepSeek and ERNIE Bot have demonstrated powerful capabilities in text generation, language translation, intelligent correction, and

personalized learning recommendations, and are profoundly reshaping both how EFL content is produced and how teachers and students interact in EFL teaching. As AI becomes more accessible to masses, teachers gain unprecedented tools to enrich their teaching. While at the same time, their established role as knowledge authorities is also challenged. If students can obtain learning resources and feedback directly from AI, teachers are compelled to reconsider what to teach and how to teach it [2].

1.2 Real - world Predicaments and Research Questions

Against these demands, current training system of teachers' digital literacy shows clear structural deficiencies. For years, training in this area mostly relies on the pattern of specialized lectures plus intensive workshop. This pattern generally shows three recurring weaknesses. On the diagnostic side, the training content is often preset by the organizers, with little precise measurement of teachers' actual literacy levels, which always leads to a mismatch between supply and need. When it comes to stratification, the same course is delivered to all teachers, ignoring differences in technical foundation, disciplinary background, career stage and institutional conditions. As to practical transfer, there is little post-training follow-up. So whether teachers have convert what they learned into real EFL teaching competence is unknown. In essence, training is arranged as isolated events rather than designed as a continuous cyclic process of diagnosis, learning, practice and reflection.

Hence, this study raises the following questions. How to establish a cyclic model that connects diagnosis, learning, practice and reflection? How does this model work to achieve systematic and school - based improvement of university EFL teachers' digital literacy? And why this model can lead to continuous improvement of university EFL teachers' digital literacy?

1.3 Research Significance

Based on these questions, this study sets out to build a closed loop that links diagnosis, learning, practice and reflection to promote the systematic, school - based enhancement in university EFL teachers' digital literacy. Its significance can be viewed from both theoretical and practical angles.

Theoretically, this study brings Teacher Professional Development (TPD), Action Research and Community of Practice (COP) together into research on EFL teachers' digital literacy. Based on these theories, it constructs a closed - loop improvement model namely "assessment - training - research - implementation". This model can offer an analytical, systematic and operational framework to fill the gap in existing research regarding closed - loop mechanism and school - based pathways.

Practically, grounded in the the particular conditions of the local university and the actual state of EFL teaching in this university, this study developed school - based assessment tools, training courses and evaluation schemes. Series of digital teaching cases are also produced to directly support the professional development of EFL teacher within this university and even similar institutions. These outputs provide referable pathways and hands-on experience for the implementation of the digital education strategy.

2. Literature Review and Theoretical Framework

2.1 Previous Studies on Digital Literacy

The concept "digital literacy" has gone through three stages. To start with, it refers to information technology application capability. Studies at that time focus on hands-on skills in using computers and networks. As technology more deeply embedded in teaching contexts, the understanding of digital literacy expanded into a richer construct. It encompasses both technical operations and the ability to locate and evaluate information, create digital content, engage in digital communication and collaboration, and addressed digital security and ethics. In recent years, with the rise of artificial intelligence, the academic community further proposed the concepts of "intelligent literacy" or "AI literacy", incorporating human - machine collaboration, algorithm awareness and data literacy into the framework of teachers' digital literacy [2].

In terms of framework construction, researchers at home and abroad have produced several dimensional systems worth drawing on. Wu et al. conducted a systematic study on teachers' digital literacy from the perspectives of conceptual evolution, standard interpretation and literacy assessment [3]. According to the

Ministry of Education, the education industry standard Teachers' Digital Literacy (JY/T 0646—2022) defines teachers' digital literacy in terms of digital awareness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development. Wang and Zhou focused on the college foreign language teacher group and constructed a framework for the connotation and development of their digital-intelligence literacy [4]. Xiao et al. evaluated and analyzed the digital literacy competence of college foreign language teachers and proposed improvement paths [5]. Internationally, the European Frame*work for the Digital Competence of Educators* (DigCompEdu) proposed by Redecker also provide references for the definition and assessment of teachers' digital literacy [6]. The measurement dimensions adopted in this study are directly informed by these frameworks.

However, looking at the existing research, there are two shortcomings. Firstly, most of the research take teachers in general and pay little attention to the teaching character of specific disciplines. It also pays insufficient attention to the connotation and structure of university EFL teachers' digital literacy and its discipline-specific relevance of the development of listening, speaking, reading, writing and translation skills in the EFL teaching. Secondly, existing studies mostly remain at defining the concept of literacy or surveying the current states [7-9], while research on how to improve is still thin. In particular, there is a lack of workable school - based improvement pathways grounded in the particular school context.

2.2 Theoretical Framework

The construction of this research mainly relies on Teachers Professional Development, Action Research and Community of Practice.

Teacher Professional Development believes that the growth of teachers is a systematic and continuous process rather than a series of isolated training activities. Darling Hammond et al. further pointed out that truly effective professional development should be long- term, context- embedded, closely tied to classroom practice [10]. It is not a one-time input, but spiral and progressive advancement. This theory lays the theoretical foundation for the systematicity and continuity of the model constructed in this study. On this basis, this model organizes the improvement of EFL teachers ' digital literacy into four stages. Assessment is the starting point, providing the basis, training is the carrier, research promotes deepening, and implementation is the final foothold. The four stages are interconnected and push the process upward together, breaking free from the constraints of one - off training.

Action research theory further points out the path for continuous improvement of teachers' digital literacy. Kemmis and McTaggart [11] and Wang [12] proposed that teachers should examine their own teaching in the cycle of plan - act - observe - reflect and become both researchers and improvers of their own practice. Accordingly, participating teachers in this model identify instructional problems in teaching, then acquire corresponding strategies through training, put them into implementation, observe the effects, and finally reflect and improve the system through research. In this way, teaches' digital literacy enhancement shifts from a passive reception to an active knowledge construction.

In Community of Practice, Lave and Wenger put forward that learning is fundamentally social in nature and individuals should achieve professional growth through collaboration, dialogue, and experience sharing within communities [13]. In this model, assessment build consensus within the community. Training and research are based on ongoing dialogues among teachers, technical experts and researchers. In this process, teachers share what they learned and communicate with each other, easing the sense of isolation during their exploratory practice. Therefore, digital literacy improvement is not just the growth of personal technical skill but also a collective effort to build shared knowledge, thereby keeping the model active and effective over time.

3. Research Design

3.1 Participants and Research Context

This research was conducted in the school of foreign languages of a local university. A total of 45 teachers participated in the training. There are obvious differences among the participants in terms of teaching years, professional titles, types of courses taught and digital - technology proficiency. As presented in Table 1, there are both early - career teachers and long - serving teachers, both teachers who teach public foreign language courses and those who teach

professional foreign language courses. Such structural differences verify the adaptability of this model in terms of stratified classification and empowerment tailored to individual needs.

Table1. Basic Information of Participants

Characteristic	Category	Number	Percentage (%)
Teaching years	≤3 years	12	26.7
	4 - 10 years	18	40.0
	>10 years	15	33.3
Professional title	Teaching assistant	10	22.2
	lecture	19	42.2
	Associate professor	12	26.7
	Professor	4	8.9
Types of courses taught	Public foreign language course	24	53.3
	Professional foreign language courses	21	46.7
Digital - technology proficiency (self - rated)	Low	14	31.1
	Moderate	21	46.7
	High	10	22.2

3.2 Research Methods

This study takes the action research method as its overall method. Researchers and participating teachers were placed in the real teaching situation to improve their digital literacy in the cycle of planning - action - observation - reflection. During this process, the model was continuously reflected and revised. Within the framework of action research, this study adopts the following four methods.

This study conducted a questionnaire survey using the self-developed Digital Literacy Assessment Scale for University EFL Teachers. Pre-tests and post-tests were administered to the participating teachers to quantify their overall digital literacy as well as changes across four dimensions including technical operation, teaching integration, digital ethics and AI application. Based on this, the overall quality and the changes of each dimension can be quantified.

Semi-structured interviews were carried out with participating teachers at the beginning, middle and end of the training to capture their baseline literacy levels, their training needs, their learning experiences and difficulties they met in putting what they learned into practice.

For case studies, representative teachers and their digital teaching practices were selected as cases. The whole closed-loop process of their teaching from initial measurement to final application was traced to yield qualitative evidence.

Classroom observation was also used. Together with teaching observation, demonstration and evaluation activities, how teachers actually bring digital technology into their classes and its outcomes are observed.

These methods creates quantitative results, qualitative self-report outcomes and performance - based evidence, enabling triangulation across them and strengthening the credibility of research conclusions.

3.3 Data Collection and Analysis

Quantitative data comes from the pre-test and post-test conducted with the self - developed Digital Literacy Assessment Scale for University EFL Teachers. Descriptive statistics are used to characterize performance across each dimension as well as the overall scores, allowing the changes in teachers' digital literacy before and after training to be captured.

Qualitative self-report outcomes are taken from transcribed interview records and teachers' teaching - reflection journals. The former allows teachers to review and evaluate the entire training, while the latter records their immediate feelings in their daily teaching. These materials reflect teacher's true self-description of their true feelings in their training, obstacles they met in practical teaching and how their digital literacy change.

Performance-based evidence comes from classroom observation records, teachers' instructional design cases and practical outputs generated in real teaching contexts. Classroom observation records how teachers use digital tools in the classroom and instructional design reflects their pre-class ideas and arrangements. Practical outcomes are the direct product of teaching. This type of evidence can compensate for potential bias inherent in self - report

outcomes.

The above three types of independent evidence are compared with each other through triangulation. Quantitative data answer whether teachers' digital literacy has improved, while qualitative self - report and performance - based outcomes jointly explain how and why that improvement occurs. Mutual comparison allows verification of the consistency between what teachers say and what they do, so as to reinforce the credibility of the research findings.

The ethical norms of this study are as follows. All data are collected with prior consent of participating teachers and their personal information is anonymized. The research results are only used for academic analysis and teaching improvement, rather than for the assessment and evaluation of individual teachers.

4. Theoretical Construction of the Model

4.1 The Overall Framework and Operational Logic

In response to the drawbacks of traditional teacher training emphasizing lecture over diagnosis, uniformity over stratification, and training over practical transfer, guided by the systematic and continuous concept of TPD, centers on Action Research, and supported by CoP, this study constructs a closed - loop driven model for the school - based improvement of university EFL teachers' digital literacy, namely "assessment - training - research - implementation".

This model regards the improvement of EFL teachers' digital literacy as a continuous spiral progressive process rather than one-off transmission of knowledge. The assessment is divided into measurement and evaluation two parts. So the whole process starts from the measurement, providing an accurate diagnosis of teachers' digital literacy. Evaluation then follows to establish a multidimensional assessment system. Training is the main pathway. Courses are designed and arranged according to the actual needs of teachers. Research deepens the process by encouraging teachers to conduct action research and case studies within their own practice. Implementation is the ultimate goal. With the help of teaching observation, demonstration and evaluation activities, teachers use what they have learned in the classroom and transform it into practical teaching improvement. Any new problems or demands that emerge during implementation are fed back into the measurement, thus forming a cycle and continuously iterating closed - loop structure shown in Figure 1.

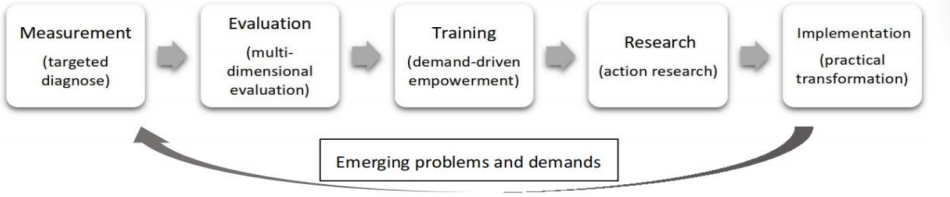


Figure 1. Framework Diagram of the Model

4.2 The Connotations and Functions of the Five Stages

Measurement is the starting point and data source of this model. A questionnaire survey is employed to diagnose teachers' digital literacy across four dimensions. They are technical operation, teaching integration, digital ethics, and AI application. This stage moves beyond judging by experience and training by intuition. It generates a clear literacy profile for each teacher and provides objective data for the following evaluation and stratified training.

Evaluation replaces the traditional result-oriented assessment with a multidimensional one. It not only examines teachers' mastery of digital technology knowledge and further examines their ability to integrate technology into teaching design, implementation and reflection. It also pays attention to both outcomes at the end of the training and the dynamic progress during the training. It is in line with the concept of sustainable development in TPD, which shifts the evaluation from screening to promoting.

Training calls for stratification and classification to achieve demand - driven empowerment. Based on the results of assessment, a modular and personalized curriculum system is provided for teachers according to their varying current status and distinct training needs. The training covers the operation of digital tools, the development of digital teaching resources, the instructional design, digital ethics and AI applications. And a team of digital mentors is established to provide one-on-one or group

guidance to avoid the resource mismatch caused by uniform training arrangements for all teachers.

Research sets this model apart from conventional teacher training. Its core is the cycle of action research. This model encourage teachers to apply what they have learned in training to real teaching context, find problems, acquire strategies through training, and then put them back into practice and observe the effects. Over time, teachers use systematic action research and case studies to accumulate experience, reflect and improve, and achieve internal circulation. In this way teachers are no longer passive recipients of technical training, but become researchers and improvers of their own instructional practices.

Implementation is the level point of this model. This study establishes a platform for teaching innovation competitions, sessions for outstanding case sharing and instructional observation and evaluation activities. It encourages teachers to turn what has been diagnosed through measurement, learned in training, and derived from research into concrete gains in teaching competence and students' learning outcomes. Moreover, emerging problems exposed in the implementation feed back to the next round of measurement, achieving closed - loop improvement of teachers' digital literacy.

4.3 The Integration of School - based Orientation and Personalization

A notable feature of this model is the integration of school-based orientation and personalization. At the institutional level, this model fully considered the EFL teaching and development strategy of the local university. Digital literacy standards, training content and evaluation plans are all set to match the university's actual conditions, ensuring teachers' development align with the university's overall objectives. At the individual level, within the overarching school-based framework, this model further pays attention to differences among teachers. Based on the results of the targeted assessment at the early stage, personalized learning paths are suggested for each teacher. This dual design not only avoids the generalized training divorced from the university's situation but also overcomes the neglect of teachers' subjectivity due to uniformity, significantly enhancing the adaptability and effectiveness of the model.

4.4 Theoretical Correspondence

To build the model on a solid theoretical foundation, this study maps the three theoretical foundations onto the five stages shown in Table 2. The systematic and continuous nature of TPD accounts for why the process is designed as a cyclic closed loop rather than a few dispersed stages. The cyclical logic of Action Research underpins the research and application stages methodologically, enabling teachers to advance their digital literacy in the process of practice, reflection and re-practice. The CoP provides the social setting in which assessment build consensus and in which training and research turn the improvement of digital literacy from an individual endeavor to a collective one.

Table 2. The Correspondence between the Theoretical basis and the Model Stages

Theoretical basis	Core proposition	Corresponding stage
TPD	Systematic, continuous and spiral progressive	Overall closed - loop model
Action Research	The cycle of plan - action - observation - reflection	Research, implementation
CoP	Social construction, collective wisdom	Assessment, training, research

5. Practical Pathway and Implementation Process

According to the internal logic of this closed-loop model, this study organized and implemented a one - year digital literacy improvement practice in the school of foreign language of a local university. The whole implementation process lasted for one year and is divided into the following five stages.

5.1 Preparatory Work and Demand Research Stage

This stage begins by developing a questionnaire and a semi-structured interview outline, which are used to establish a baseline of teachers' digital literacy and their actual training needs and to inform the following design of evaluation tools and training content. Questionnaires and interviews cover several aspects including technical basis, teaching application status, training willingness and content preference.

On this basis, an analysis report on teachers' digital literacy status and training willingness is

produced. The report points out the shortcomings and demands of teachers in technical operation, teaching integration, digital ethics, and AI application, laying a solid foundation for the subsequent categorized and stratified training.

5.2 Evaluation and Training Planning Stage

Drawing on the preliminary research, this study develops a Digital Literacy Assessment Scale for University EFL Teachers and uses it to conduct a pre - test across four dimensions including technical operation, teaching integration, digital ethics, and AI application. The measurement data reveals participating teachers' digital literacy levels and deficiencies of different groups. A categorized and stratified training plan is then drawn up, specifying the training objectives, content, forms and implementation strategies.

This stage produces a school - based digital literacy measurement scale and evaluation systems, pre - test data on teachers' digital literacy and a categorized and stratified training plan.

5.3 Implementation Stage

With evaluation results in hand, categorized and stratified training is delivered to match individual teacher needs. An online platform is built and opened to teachers. This platform offers diverse digital resources and delivers online courses. At the same time, offline workshops and hands - on training sessions are launched, covering digital tool operation, digital teaching resource development, instructional design, digital ethics and AI application. A team of digital mentor is also set up to provide one - on - one or group guidance targetedly for teachers with different demands and troubles. Throughout the process, teachers' feedback is continuously collected to adjust the training content.

At this point, one round of categorized and stratified training has been completed, along with a set of digital instructional design cases and records of feedback and adjustment.

5.4 Research and Case Development Stage

In this stage, mini- researches are launched and teachers are organized to conduct action research and case studies on cutting - edge topics such as AI-assisted instruction, big - data - driven learning analytic, and blended teaching. Professional guidance and resource support are also provided to promote deep integration of technology and teaching. Through teaching demonstrations, observations, and evaluation activities, outstanding teaching cases are collected and organized to build an initial digital teaching case repository.

The outputs include findings from teachers' action research and mini - research projects, and digital - teaching case repository, and a set of exemplary cases for wider dissemination.

5.5 Achievement Refinement and Promotion Stage

The final stage consolidates the research findings to complete achievement promotion. Pre - test and post - test data are compared to gauge the extent of improvement in teachers' digital literacy. At the same time, the research results accumulated during the process are sorted out to enrich the digital teaching case repository. On this basis, the research and training summary report and the conclusion report are compiled and all kinds of materials needed for the display and promotion of results are prepared. Finally it's time to organize exchange and sharing activities within and beyond the university.

So far, this practical research has formed a comparative analysis reports on teachers' digital literacy, a systematic research and training reports, a set of relatively mature digital teaching cases, and a set of data for conclusion and promotion.

5.6 Overall Characteristics of the Implementation Pathway

Looking at the four stages, assessment - training - research - implementation is not a separate linear step, but an interconnected cyclic whole. The assessment in the early stage provide precise basis for training. The training and research in the middle stage intertwine and feed back to training through research. The implementation in the later stage not only puts the results to the test but also feeds back the emerging problems to the next round of assessment, making the whole process takes a spiral progressive and continuous character. It is this pathway that sets the proposed model apart from traditional one - off training.

6. Practical Outcomes and Case Analysis

6.1 Quantitative Data of Teachers' Digital

Literacy

This study uses the comparison of pre - test and post - test data to determine whether teachers' digital literacy has improved. The overall change is reported first, followed by a breakdown across the four dimensions.

To evaluate the effectiveness of the model, the digital literacy of participating teachers was measured before and after the intervention. The five-point scale was used twice. As shown in Figure 2, the overall score of teachers' digital literacy rose from 3.20 points to 4.08 points, with an increase of 0.88 points.

From a multi - dimensional perspective, all dimensions show changes to varying degrees. The technical operation dimension has risen from 3.48 to 4.30; the dimension of teaching integration has risen from 3.15 to 4.02; the dimension of digital ethics has risen from 3.36 to 4.20; the AI application dimension rises from 2.72 to 3.95, with the lowest pre - test foundation but the largest increase of 1.23 points, indicating that the targeted training has achieved the expected effects.

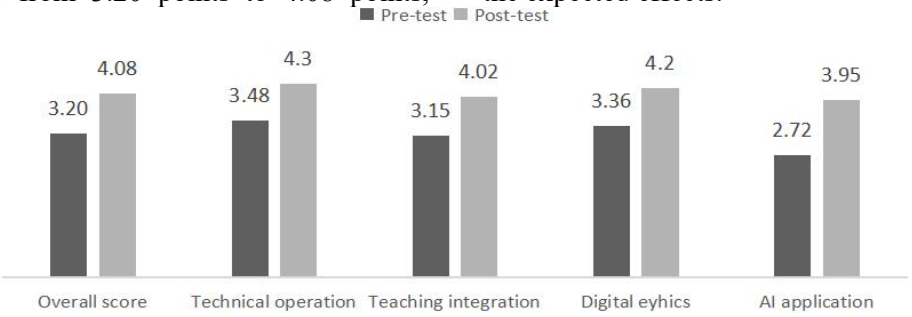


Figure 2. Comparison of Scores in each Dimension of Pre-test and Post-test Data

6.2 Qualitative Outcomes: Case Analysis

This section presents a typical case of a middle - aged teacher gradually moving from avoiding technology to cooperating with AI to illustrate how and why the improvement occurred.

Teacher A, an associate professor with 18 years of teaching experience, is responsible for professional English courses. His pre - test scores on technical operation and AI application were relatively low, and his self - assessment also revealed a fear of new technology.

According to this, the assessment results classified him as a teacher with a weak foundation and generated a personalized learning path for him, focusing on his two weak points of digital tool operation and AI - assisted teaching. During training, he was assigned to the group with limited foundational skills. There he received one-on-one guidance, took part in a workshop on AI - assisted teaching, and learned to use large models to produce teaching resources and homework feedback. Then he applied what he had learned to his *College English* course, using AI tools to generate contextualized language materials and provide immediate feedback for students' oral practice. At the research stage, he carried out a small - scale action research entitled *Practice and Reflection on AI - powered Feedback in Foreign Language Teaching*.

In the post - test, his AI - application score rose from 2.4 to 4.0. His instructional design case was selected for the university's digital - teaching case repository and won the second prize in the Teaching - Innovation Competition. In his teaching - reflection journal, he wrote: "I used to think that AI was far from classroom practice. Now I realize that what really needs to change is not merely technical proficiency, but the willingness to re - examine himself and classroom teaching. "

The analysis of interview data and teaching - reflection journal also shows a broader shift in teachers' role from knowledge transmitters to learning designers, facilitators and AI - collaborators. In interviews, many teachers mentioned that the key to enhancing digital literacy is not to master a certain tool but to rethink the value of technology in foreign language teaching and use it to support personalized learning and formative assessment.

These findings suggest that the effectiveness of this model not only lies in measurable skill gains, but also in the transformation of teachers' professional identity and their conceptions of teaching.

7. Conclusions and Implications

7.1 Main Findings

Under the dual background of the construction of New Liberal Arts and the digital transformation of education, this study targets

the drawbacks of "emphasizing lecture over diagnosis, uniformity over stratification, and training over practical transfer" in the digital literacy training of university EFL teachers, constructs and implements a closed - loop driven school - based orientation model namely assessment - training - research - implementation. After a year of practice, several key conclusions can be drawn.

To begin with, the closed - loop model of assessment - training - research - implementation can indeed improve university EFL teachers' digital literacy. The comparison between pre - test and post - test data shows clear improvement across technical operation, teaching integration, digital ethics, and AI application. Among them, AI application yields the most significant one. This result confirms the value of accurate diagnosis and targeted training.

What makes the model work is the closed-loop mechanism itself. Assessment creates reliable basis for training together. Training and research are interwoven. What teachers learn in training informs their research, and research findings, in turn, feed back into training content. Implementation puts the results to the test and brings about new problems that trigger the next round of assessment. In this way, teachers' development is turned from a one - off training to an ongoing spiral progressive process.

Another factor contributing to the model's adaptability and effectiveness is its dual focus on school - based orientation and individual differences. While paying attention to the broad school - based framework, training plans are also customized tailored to teachers' individual conditions. In this way, teachers' professional development moves in step with universities' strategic objectives, and at the same time, their individual needs and differences are fully taken into account.

Beyond measurable skill gains, the model has also prompted a notable shift in teachers' professional roles. They are no longer simply knowledge transmitters but have taken on new identities as learning designers, guides, and AI collaborators. It can be said that the deeper value of improving teachers' digital literacy lies not merely in skill acquisition but also in renewing teachers' professional identities and their fundamental conceptions of teaching.

7.2 Implications

This study carries the following implications for the improvement of university EFL teachers' digital literacy and for the broader field of teacher professional development. One implication is that digital literacy improvement ought to be treated as a systematic, ongoing process rather than an isolated one-off event. Another is that improvement must be firmly grounded in the specific school context while maintaining a response to individual differences among teachers. Finally, in the age of artificial intelligence, the heart of teachers' digital literacy development has shifted from acquisition of technical skills to reshaping their roles and concepts.

7.3 Limitations

When interpreting the research results, there are still some limitations to be explained. For one thing, the research sample is only from 45 teachers in a single local university, and there is no control group. So it is difficult to rule out the influence of external factors such as the university's investment in information technology and teachers' natural professional growth. Another limitation concerns the research period. 1 year is relatively short. And the post - test results mostly reflect short - term effects. Whether the gains are maintained over the longer term and whether they transfer to students' learning outcomes still need to be observed. A third issue relates to the assessment system itself. Although it is designed to cover multiple dimensions, it is still difficult to capture teachers' personal qualities such as attitudes and professional beliefs. These above - mentioned limitations point to directions for future research.

7.4 Suggestions for Future Studies

Future research could proceed in three directions. First, the sample should be enlarged and a control group can be introduced to strengthen the external validity of the findings. Second, the study period should be expanded so that the persistence of gains in digital literacy and their transfer to students' EFL learning outcomes can be examined over the longer term. Third, this model could be applied to teachers in other disciplines and institutions to form a more general approach to improving teachers' digital literacy.

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