A Study on the Current Situation Analysis and Cultivation Strategies of Digital Literacy for Liberal Arts Normal Students under the Background of Educational Digital Transformation

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Abstract: This project focuses on the cultivation of digital literacy for liberal arts normal students, aiming to construct a scientific promotion system. Firstly, based on the needs of educational informatization and the characteristics of liberal arts normal students' quality, this study clarifies the conceptual connotation of digital literacy and constructs a competency framework including digital awareness, knowledge, skills, ethics, and innovation. With reference to authoritative indicators and combined with the cultivation characteristics of liberal arts normal students, a standardized questionnaire covering the current literacy status, development needs, and influencing factors is designed to lay the foundation for data collection. In the research stage, a mixed-method approach (quantitative and qualitative) is adopted. Through statistical analysis of questionnaire data, the overall level, structural differences, and development characteristics of digital literacy among liberal arts normal students are revealed. Simultaneously, in-depth interviews are conducted to excavate core influencing factors such as curriculum design, resource supply, and learning motivation, accurately positioning the pain points and needs for literacy improvement. Finally, targeting to strengthen digital literacy cognition and enhance digital technology application, and closely aligned with the professional development path of liberal arts normal students, specific strategies are proposed from five dimensions: updating educational concepts, optimizing the curriculum system, innovating teaching models, building practical platforms, and constructing a multi-dimensional evaluation mechanism. These strategies include integrating digital technology case-based teaching, promoting online-offline blended learning, and establishing a multi-stakeholder evaluation system, aiming to provide replicable practical solutions for the digital transformation of normal education and help liberal arts normal students adapt to the information technology development needs of future education and teaching.

Keywords: Digital Literacy; Liberal Arts Normal Students; Educational Digital Transformation

1. Introduction

In the current era, the digital transformation of education has emerged as an inevitable trend in the global development of education, profoundly reshaping the forms and models of education. With the rapid advancement of information technology, the extensive application of digital technologies in the field of education has not only transformed teaching methods and learning experiences but also put forward entirely new requirements for teachers' professional competencies. As an important reserve force for the future teaching workforce, the level of digital literacy among liberal arts normal students is directly related to the quality of future education and teaching, as well as the effectiveness of promoting educational digital transformation. However, at present, there is a relative lack of research on the digital literacy of liberal arts normal students in the academic community, and numerous problems that urgently need to be addressed exist in the existing cultivation strategies. Therefore, an in-depth exploration of the current situation of the digital literacy of liberal arts normal students and the proposal of targeted cultivation strategies possess significant theoretical value and practical significance. This study aims to fill the gaps in the relevant fields through systematic research and provide valuable references and insights for enhancing the digital

literacy of liberal arts normal students and promoting the digital transformation of education.

2. Research Objectives

2.1 To Clarify the Distinctions in Digital Literacy Between Liberal Arts Normal Students and in-Service Teachers

Considering the significant differences in growth backgrounds, learning environments, and practical experiences between liberal arts normal students and in-service teachers, this study focuses on exploring the unique requirements of digital literacy for liberal arts normal students, so as to differentiate them from the digital literacy standards for teachers.

2.2 To Construct a Tailored Cultivation Framework for Digital Literacy of Liberal Arts Normal Students

Aiming at the particularity of liberal arts normal students and the needs of educational digitalization, this study intends to establish a scientific and systematic cultivation framework for digital literacy. This framework is designed to standardize and guide the enhancement of digital literacy among liberal arts normal students, ensuring the pertinence and effectiveness of cultivation.

2.3 To Propose and Implement Effective Promotion Strategies

Based on an in-depth analysis of the current situation and the construction of a proprietary framework, this study will design and implement a series of practical promotion strategies. The goal is to comprehensively improve the digital literacy of liberal arts normal students and lay a solid foundation for their future educational and teaching work.

2.4 To Enhance the Self-Awareness of Liberal Arts Normal Students and the Effectiveness of Institutional Cultivation

This study not only helps liberal arts normal students gain a clearer understanding of their own digital literacy levels and improvement spaces but also provides normal universities with more targeted cultivation programs and approaches, thereby ensuring the effectiveness and efficiency of cultivation.

2.5 To promote the Overall Improvement of

Digital Literacy Among Future Teacher Teams

As the reserve force for future teacher teams, the enhancement of digital literacy among liberal arts normal students is of vital significance for improving the quality of the entire teacher team. This study aims to lay a solid foundation for improving the digital literacy of future teacher teams through systematic and scientific cultivation strategies, thereby promoting the comprehensive digital development of education and teaching in China.

3. Research Content

3.1 Defining the Conceptual Connotation of Digital Literacy for Liberal Arts Normal Students

First, this study uses literature research to sort out the developmental context of the concepts of digital literacy and related competencies. Guided by relevant literature and theories, it examines and defines the conceptual connotation of digital literacy for liberal arts normal students from multiple perspectives, including the basic connotation of literacy, technical philosophy, personality psychology, behavioral identity, and talent cultivation. This lays a solid theoretical foundation for framework construction and strategy research (Zheng Gu & Xuesong Gao, 2025: 189).

3.2 Investigation into the Current Status of Digital Literacy among Liberal Arts Normal Students in Jinan-based Universities

Based on the established framework dimensions, this study designs, tests, distributes, collects, and analyzes questionnaires. Following the questionnaire data, it selects appropriate participants for semi-structured interviews and integrates/analyzes the data to verify the rationality and practicality of the framework. After pre-surveys and formal investigations, it analyzes the current status and problems of digital literacy among liberal arts normal students in Jinan-based universities.

3.3 Constructing a Digital Literacy Framework for Liberal Arts Normal Students in China

Through interpreting relevant domestic and interState-level framework standards and China's policy documents, this study determines the principles for framework construction,

screens sample contents, and uses online content coding and statistical analysis tools for element extraction, coding, and integration to condense the core elements of digital literacy for liberal arts normal students. A preliminary framework is constructed, which is then revised and refined through a two-round expert survey method to finalize the framework.

3.4 Proposing Promotion Strategies for Digital Literacy of Liberal Arts Normal Students

Aiming at the current status and problems of digital literacy among liberal arts normal students identified in the investigation, this study proposes targeted promotion strategies. It aims to empower future educators (i.e., normal students) to enhance their digital literacy, enabling them to confidently address the challenges of digital education. The strategies also aim to help more liberal arts normal students recognize the necessity of improving digital literacy, gain a clearer understanding of their own literacy levels, broaden their thinking, and support their future digital education work and lifelong digital learning.

4. Innovative Highlights

4.1 Innovation in Research Object: Exploring Digital Literacy of Liberal Arts Normal Students in Pre-Service Stage

In the process of educational digital transformation, digital literacy of in-service teachers has received extensive attention, while that of normal students (as the reserve force for teachers) has been relatively overlooked. Liberal arts normal students require a digital literacy framework more aligned with their age-specific cognitive and behavioral characteristics. Therefore, this study further explores the digital literacy of liberal arts normal students in the pre-service stage based on teacher digital literacy standards. This not only responds to State-level policy calls and implements the cultivation of teacher digital literacy in detail but also empowers China's teacher reserve force to lead the high-level development of educational digitalization.

4.2 Innovation in Research Perspective: Integrating Learning and Application throughout Educational Practice

Through a review of existing literature, the research team found that current strategies for enhancing digital literacy of liberal arts normal students primarily focus on knowledge input, neglecting the critical aspect of output. This has led to issues such as formalism, low proficiency, and poor effectiveness in their digital education practice. This study addresses the entire process from absorbing digital literacy knowledge to applying it in educational practice, aiming to enrich cultivation strategies through the organic unity of input and output. This approach enhances the proficiency and effectiveness of digital literacy, enabling students to internalize knowledge and externalize skills.

4.3 Innovation in Research Methods: Triangulation of Methods for Liberal Arts Normal Students' Competencies

A literature review shows that most studies on this topic rely on qualitative methods, whereas this research adopts a "mixed-method approach" integrating qualitative and quantitative methods. By combining literature research, interview surveys, questionnaire surveys, and SPSS quantitative analysis, the study provides a more comprehensive analysis of the current status and promotion strategies for digital literacy. This methodological integration represents an innovative approach to the field.

4.4 Innovation in Research Foundation: Aligning with State-Level Policies under Educational Digital Transformation

On February 8, 2022, the *Key Tasks of the Ministry of Education in 2022* was released, proposing the implementation of the Educational Digital Transformation Strategy.

On November 30, 2022, the *Digital Literacy for Teachers* issued by the Ministry of Education outlined the framework for future teachers' digital literacy, providing a reference for cultivating normal students with high digital literacy.

This study actively responds to these policies, focusing on the backdrop of educational digital transformation to analyze the current development of digital literacy among liberal arts normal students. It aims to optimize cultivation strategies and contribute to the modernization of China's education sector.

5. Project Characteristics

5.1 Driven by State-Level Strategy, Precisely

Aligned with Educational Digitalization Policies

As educational digitalization becomes a State-level strategic priority for China's education reform, the competency development of educational talents faces new challenges. Digital literacy for teachers has been prioritized in the State-level digital literacy promotion agenda, attracting growing research attention and policy emphasis.

5.2 Foundational for Lifelong Development: An Integrated Pre-service and In-service Literacy Growth Engine

Current research on digital literacy, still in its infancy, remains weak regarding pre-service teachers (i.e., liberal arts normal students). Many studies attribute teacher competency development solely to in-service stages, overlooking the critical pre-service accumulation phase—thus neglecting the holistic integration of pre-service and in-service cultivation.

5.3 Ecological Collaboration Empowerment: Stimulating Multi-Stakeholder Co-Creation of Digital Education Ecosystem

Liberal arts normal students, as the talent pool for future educators, need enhanced digital literacy to not only address current digital challenges but also lead future educational digitalization. This study aims to inspire enterprises, universities, primary-secondary schools, educators, and normal students to prioritize digital literacy cultivation, proposing effective strategies to promote China's digital education ecosystem.

5.4 Theoretical Framework Breakthrough: Constructing an Arts-Science Interdisciplinary Digital Literacy Cognitive Framework

Theoretical: This study clarifies the conceptual connotations and historical development of digital literacy for liberal arts normal students and educational digitalization, theoretically analyzing the current status of digital literacy among full-time undergraduate liberal arts normal students.

Methodological: Based on quantitative analysis of questionnaire data and qualitative interpretation of interview data, it identifies influencing factors and proposes evidence-based strategies, enriching research on this specific population.

Output: The research report updates empirical data on digital literacy, providing a reference for subsequent studies.

5.5 Diagnosis-Improvement Closed-loop Design: Dynamic Optimization Mechanism Supported by Quantitative Data

Practical Implementation: Quantitative analysis of questionnaire data objectively assesses digital literacy status, while interview data identifies influencing factors to propose targeted strategies.

Impact Expansion: The research outcomes raise awareness among liberal arts normal students about the necessity of digital literacy, encouraging them to enhance relevant competencies for competitive advantages in the job market and lifelong development.

6. Technical Route

6.1 Research Logic

This study focuses on "current status analysis and cultivation strategies of digital literacy for liberal arts normal students under the background of educational digital transformation". Based on the strategic deployment of "building an intelligent education environment" proposed in China Education Modernization 2035 and in line with the core requirement of "cultivating teacher teams adapted to the digital era" in the Digital Literacy for Teachers standard, it takes the digital literacy capability needs of liberal arts normal students in basic education digital transformation as the logical starting point, constructing a research logic and framework of "current status diagnosis - problem attribution - strategy construction".

6.1.1 Problem Proposal and Deconstruction

Against the research background, this study proposes the questions to explore: What is the current status of digital literacy among liberal arts normal students in China? How to enhance their digital literacy? Answering these requires first clarifying two sub-questions: (1) How to define the conceptual connotation of digital literacy for liberal arts normal students; (2) How to construct a cultivation strategy framework that meets the requirements of educational digitalization and targets liberal arts normal students.

6.1.2 Problem In-depth Analysis

Guided by literature research and relevant

theories, this study first defines and analyzes the concept of digital literacy for liberal arts normal students based on clarifying the connotation of digital literacy. It then interprets China's educational digitalization policies, digital literacy-related documents, and authoritative interState-level digital literacy reports. Combining with the conceptual connotation of digital literacy for liberal arts normal students, it analyzes and plans the cultivation strategies proposed in this study.

6.1.3 Problem Solution and Expansion

Under the guidance of relevant theories, the study determines the research subjects, designs questionnaires, conducts pre-surveys, forms formal questionnaires, collects data, and statistically analyzes the digital literacy of full-time undergraduate liberal arts normal students. This analysis reveals the overall level and specific status of their digital literacy, as well as identifies influencing factors. Based on mastering the current status, combined with interview data, it further explores the development needs and influencing factors of digital literacy, and proposes practical promotion strategies.

6.2 Research Methods

This study primarily employs literature research, questionnaire survey, interview research, and expert survey methods.

6.2.1 Literature Research Method

Through comprehensive retrieval and analysis of domestic and interState-level research literature on digital literacy, especially that of liberal arts normal students, the research team established the theoretical framework and direction of the study. This approach helps clarify core concepts, guides the construction of literature reviews, and provides a solid theoretical foundation for the selection of research methods and the development of the report framework.

6.2.2 Questionnaire Survey Method

Based on the literature review, the research team developed a questionnaire designed to assess the current status of digital literacy among liberal arts normal students. Through pre-testing, data analysis, and necessary questionnaire revisions, the validity and reliability of the questionnaire were ensured, thus providing a data foundation for in-depth analysis of the digital literacy level and influencing factors of liberal arts normal students.

6.2.3 Interview Research Method

To compensate for the depth limitations of questionnaire surveys, this study adopted a semi-structured interview approach. Based on the results of questionnaire data analysis, the research team developed an interview guide and selected full-time undergraduate liberal arts normal students as interviewees. This method enabled the study to gain deeper insights into the current status and determinants of digital literacy among liberal arts normal students.

6.2.4 Expert Survey Method

The research team applied the Delphi method, an expert survey technique, to solicit opinions from domain experts on strategies for enhancing digital literacy among liberal arts normal students. Through multiple rounds of anonymous feedback and iterative revisions, the study aims to ensure that the proposed strategies are both scientifically sound and practical, and to achieve broad consensus among experts.

7. Proposed Problems to Solve

7.1 Key Problem 1: Lack of Innovation in Cultivation Strategies for Digital Literacy of Liberal Arts Normal Students

With the rapid development of information technology, digital technologies have transformed educational forms. As the main force of future educators, liberal arts normal students must enhance their digital literacy to meet the inevitable requirements of educational informatization, as their education practice guided by digital literacy profoundly influences educational digital transformation. However, preliminary research and academic review show that current strategies for enhancing their digital literacy primarily focus on knowledge input, neglecting the critical aspect of practical output. This has led to issues such as formalism, low proficiency, and poor effectiveness in their digital education practice. Therefore, this study addresses the entire process from absorbing digital literacy knowledge to applying it in education, aiming to enrich cultivation strategies through the organic unity of input and output, improve proficiency, and enhance effectiveness—enabling students to internalize digital literacy and externalize skills.

7.2 Key Problem 2: Low Implementation Effectiveness of Digital Literacy Cultivation Strategies

Initial research indicates that although theories exist for enhancing digital literacy of liberal arts normal students, they often remain at the level of top-level concepts or empirical assumptions, resulting in poor practical implementation. This has caused the cultivation strategies to lack clear objectives and rational planning, yielding insignificant effects. Thus, this project will comprehensively examine guiding theories and concepts, provide recommendations from an implementation and feasibility perspective, and extract specialized guiding theories with high feasibility for enhancing their digital literacy.

7.3 Key Problem 3: Role Positioning of Liberal Arts Normal Students in Educational Digital Transformation

The Education Informatization 2.0 Action Plan issued by the Ministry of Education explicitly states the goal of transitioning education informatization from Era 1.0 to 2.0 and constructing new talent cultivation models. As the reserve force for future teacher teams, liberal arts normal students serve as critical pivots for achieving educational digitalization goals and should act as key subjects in driving digital transformation. This study will comprehensively assess available resources and gaps, analyze the current status of their digital literacy, examine existing digital literacy education, and actively respond to the Action Plan's objective of comprehensively enhancing digital literacy of teachers and students—thereby improving the educational competitiveness of liberal arts normal students.

8. Expected Outcomes

8.1 Formulating Organized and Systematic Academic Papers and Research Reports

The research team plans to complete at least two academic papers and compile a detailed research report. These documents will comprehensively analyze collected quantitative data (including questionnaire results, index scores, etc.) and qualitative data (such as interview records, field observation notes, etc.), presenting the issues, solutions, and practical application value of digital literacy enhancement for liberal arts normal students in a systematic manner.

8.2 Applying Research Findings to Digital Education Practice

It is expected that the research outcomes will be applied in the digital education practice of liberal arts normal students, directly influencing the digital literacy education and improvement of numerous students. Meanwhile, we hope these findings can be referenced by education policymakers to promote the improvement and optimization of relevant education policies.

8.3 Enriching Theories on Digital Literacy of Liberal Arts Normal Students

The research objectives include proposing at least three new theoretical perspectives based on existing theories, through empirical and experiential research methods. These perspectives will be published in academic journals to enrich and expand the theoretical framework of digital literacy for liberal arts normal students.

9. Conclusion

This study conducts an in-depth exploration of the digital literacy of liberal arts normal students against the backdrop of educational digital transformation. Through multi-dimensional research methods, a series of innovative and practically valuable achievements have been obtained. The research clarifies the conceptual connotation of the digital literacy of liberal arts normal students, constructs a scientific competency framework, conducts an in-depth investigation into the current situation of their digital literacy, accurately identifies existing problems and influencing factors, and proposes practical cultivation strategies from five dimensions, including updating educational concepts and optimizing the curriculum system. These achievements not only help liberal arts normal students enhance their own digital literacy and adapt to the information technology development requirements of future education and teaching but also provide new ideas and directions for talent cultivation in normal universities. Meanwhile, they respond to the policy call for national educational digital transformation and have a positive significance for promoting the comprehensive digital development of education and teaching in China.

However, with the rapid development of digital technology, the cultivation of digital literacy among liberal arts normal students is an ongoing process. Future research can further focus on the new requirements imposed by the latest developments in digital technology on the

digital literacy of liberal arts normal students, continuously track the implementation effects of cultivation strategies and dynamically optimize them, and strengthen cross-regional and cross-institutional collaborative research to obtain broader and more representative data. This will provide more comprehensive theoretical support and practical guidance for the cultivation of digital literacy among liberal arts normal students.

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