

**DEVELOPMENT OF EDUCATIONAL INNOVATION SYSTEMATIC PLANNING:
USING PERSONNEL MANAGEMENT PRACTICES, ORGANIZATIONAL STRUCTURE,
CULTURAL DYNAMICS, AND TECHNOLOGICAL FRAMEWORKS**

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ABSTRACT

This study explores the integration and innovation of educational technology within Chinese higher education institutions, focusing on the roles of human resources management, organizational structure and culture, and the technological landscape. The research methodology is structured in three distinct phases, encompassing both qualitative and quantitative approaches. In the qualitative phase, interviews and focus group discussions were conducted with 20 administrators and faculty members drawn from various universities to gather in-depth insights into the current practices and challenges. The quantitative phase involved administering a structured questionnaire to a larger sample of 280 participants, including teachers, IT staff, and administrators, to statistically validate the relationships between integration practices and their impacts. Data analysis was conducted using dual approaches: content analysis for the qualitative data, which helped identify emerging themes and patterns, and structural equation modeling (SEM) for the quantitative data, which assessed the interactions among variables related to personnel management, organizational structures, and technology use. These methods provided a robust framework for understanding the dynamics of educational technology integration and its effects on institutional practices. The findings reveal that human resources management practices are critical in supporting and promoting the integration of technology into teaching and learning environments. These practices help create a conducive atmosphere that fosters educational technology innovation. However, the study also identifies significant challenges within organizational structures and cultures that hinder the seamless integration of new technologies. Additionally, the technological landscape presents dual aspects of opportunities and challenges, as the rapid pace of technological advancement demands constant adaptation and innovation. The research highlights the need for systematic planning and strategic initiatives to overcome these

challenges and fully harness the potential of educational technology in enhancing teaching and learning. The study's insights contribute to the broader discourse on educational innovation and provide a framework for similar institutions aiming to integrate technology effectively.

Key Words: Educational Technology, Integration, Innovation

Introduction

Educational technology workforce management is critical for the successful integration and application of technology in teaching and learning around the world. It involves recruiting and retaining talented employees, and focuses on continuous development and adaptation to the changing technological landscape (Voogt et al., 2018). Educational institutions are increasingly aware of the need to have well-trained and well-organized human resources to drive technological innovation. How can personnel management change the organizational structure of an educational institution? For example, it could lead to the establishment of a more decentralized and flexible system. Helps create more independence and creativity, which promotes innovation (Tonwimonrat, 2021)

Personnel management is of paramount importance in the integration and innovation of educational technology in universities around the world. It points to the need for a more comprehensive understanding and effective implementation of strategic HR practices, which can stimulate innovation. These challenges in personnel management can significantly hinder successful integration and innovation of educational technology in universities.

Educational technology innovation within universities is a multifaceted process that requires access to technology and its effective integration into teaching. The same is true in many areas around the world. There is a clear gap between the potential of educational technology and its actual use (Bingimlas, 2009). From studies at many universities It found that China needs more professional development opportunities, and receive more support for teaching administrators and staff to use educational technology and use educational technology effectively. In order not to be an obstacle to innovation. These challenges in personnel management education management and organizational structure adapting organizational practices, policies, and infrastructure to the changing technological landscape means that educational institutions may need assistance in allocating resources, infrastructure improvements and policy revisions to accommodate new technologies (Bates, 2019).

Jinzhong City, a medium-sized Chinese city with a population of 3.3 million and thirteen higher educational institutions, presents a unique and insightful case study on personnel management challenges within educational technology innovation. The city struggles to keep up with rapid technological advancements and align its institutional practices accordingly, grappling with recruiting and retaining technically proficient staff and providing adequate training in current educational technologies. Their difficulty sourcing and maintaining innovative staff, paired with gaps in technology training, underlines the global problem many educational institutions encounter when integrating new technologies. By examining these obstacles, the researcher aims to cultivate a broader understanding of effective personnel management strategies in educational technology, offering potential guidance for global policies and practices.

Research Objectives

1. To explore and understanding the current practice of personal management, and organization structure Culture, and technological landscape.
2. To develop the model for integrating and innovation of education technology.
3. To study the impact of integration and innovation of Education Technology on Personal management practice, Organization Structure and culture, Technological Landscape.
4. To propose the plan for promoting Integration and innovation of Education Technology in Chinese higher education institutes.

Research Methodology

This study was divided into three dependent phases:

Phase 1: Exploratory qualitative analysis

Phase 2: Develop and validate a casual model

Phase 3: Propose and confirm the plan for promoting integration and innovation of education technology in Chinese higher education institutes.

Table 1 Research Framework

| Research Objectives | Qualitative Method | Instrument | Date Source | Date Analysis |
|---|--|--|--|---------------------------------|
| 1. To explore and understanding the current practice of personal management, and organization structure & culture, and technological landscape. | Qualitative research | Interview sheet | Answers from teachers, IT staff, administrators (n=20) | Content Analysis |
| 2. 2.1 To develop the model for integrating and innovation of education technology | Qualitative research | Focus group discussion | Answers from 5 experts | Content Analysis |
| 2.2 To study the impact of integration and innovation of Education Technology on Personal management practice, Organization Structure and culture, Technological Landscape. | Quantitative research | Questionnaire | Data from teachers, IT staff, administrators (n=280) | SEM |
| 3. To propose the plan for promoting Integration and innovation of Education Technology in Chinese higher education institutes. | Qualitative research; Quantitative research | Focus group discussion; Questionnaire | Answers from experts (n=10); Answers from experts (n=5) | Content Analysis; Means, S.D |

Research Design and Approach: The qualitative approach allows for a rich, narrative understanding of complex systems. The researcher has chosen a phenomenological research design that is ideally suited to capture the lived experiences of individuals interacting with educational technology.

Population and Sampling: The target population included administrators and faculty from a variety of universities who were directly engaged with educational technology. Subsection: Stratified Sampling Technique. A stratified sampling technique was used to ensure diverse representation across different types and sizes of institutions. Subsection: Sample Size Justification A discussion on theoretical saturation will be provided to justify the sample size of 20 participants.

Research Instrument: Develop some interviewing questions with open-ended answers based on the research objectives and literature review. Pilot Testing the Interview Guide The interview guide will be pilot-tested with a small subset of the population to ensure clarity and relevance of the sampling.

Data Collection Procedures: Sampling Strategy. The strategy for recruiting participants, including outreach and informed consent processes, will be detailed. Conducting the Interviews Procedures for conducting the interviews, including logistics, recording, and transcription protocols, will be outlined.

Data Analysis

Coding and Theme Identification. We will describe the coding process, including first and second cycle coding methods used to identify themes. **Ensuring Credibility and Trustworthiness** Strategies to ensure the credibility of the qualitative findings, such as member checking and triangulation, will be detailed.

Statistical Analysis The analytical phase commences with descriptive statistics to summarize the data, followed by advanced analyses using AMOS for Structural Equation Modeling (SEM). This

sophisticated statistical technique enables the examination of complex relationships between multiple independent and dependent variables, offering insights into the direct and indirect effects within the hypothesized model. SPSS will facilitate the initial data handling and descriptive analysis, setting the stage for the more complex SEM.

Table 2 Analysis of Theme Framework

| Dimension | Variables | Representative text |
|---|---|--|
| A) Personnel management practices | a1) Recruitment Strategies | We focus on not only attracting individuals with technical expertise but also those who have a passion for education and innovation. |
| | a2) Professional Development | Our training programs emphasize not only the technical aspects but also the pedagogical implications of using technology in education. |
| | a3) Retention Strategies | To retain staff, we prioritize creating a supportive work environment that values continuous learning and professional development opportunities. |
| A) Organization Structure & Culture | b1) Hierarchical Structure | Streamlining administrative processes and providing adequate technical support can help facilitate technology integration. |
| | b2) Communication Channel | With effective leadership and communication, hierarchies can also facilitate the dissemination of technological initiatives throughout the organization by providing clear direction and support. |
| | b3) Collaboration Mechanisms | A culture that values experimentation, collaboration, and adaptation tend to foster innovation in technology integration. |
| B) Technological Landscape | c1) Available Technologies | Our university boasts a robust technological infrastructure that supports various educational activities. This includes cutting-edge classroom technology, high-speed internet access, and a wide range of educational software and tools. |
| | c2) Pace of Technological Advancements | Fostering partnerships with industry leaders and other educational institutions can provide valuable insights and resources for innovation. |
| | c3) Faculty Technological | Faculty members receive training and support to effectively integrate technology into their teaching practices while maintaining pedagogical integrity. |
| C) Integration & Innovation of Education Technology | d1) Level of Technology Integration | We facilitate interdisciplinary collaboration to identify emerging trends and best practices in educational technology. |
| | d2) Frequency of innovative Practices | Overall, the frequency of innovative practices can be influenced by various internal and external factors. |
| | d3) Teaching and Learning Outcomes Skills | Strategies for improving the technological competency of staff include providing comprehensive training programs, encouraging continuous learning and professional development, and creating incentives for staff to enhance their technological skills. |

Research Results

That Personnel management practices play a crucial role in the integration and innovation of educational technology. Educational institutions that prioritize effective personnel management practices create an environment that supports and promotes the integration of technology in teaching and learning (Pinglei & Haibing, 2016). These practices include recruiting and hiring educators who have a strong understanding of technology and its potential in the classroom, providing ongoing professional development opportunities to enhance teachers' technological skills and pedagogical knowledge, creating a supportive and collaborative culture where teachers feel comfortable experimenting with new technologies, and providing sufficient resources and support for technology integration (Mumtaz, 2000). By implementing these personnel management practices, educational

institutions can ensure that teachers are equipped with the necessary skills and knowledge to effectively integrate technology into their classroom practices.

Table 3 Reliability Statistics

| Dimension | Cronbach's Alpha | N of Items |
|---|------------------|------------|
| A) Personnel management practices | 0.84 | 3 |
| B) Organization Structure & Culture | 0.85 | 3 |
| C) Technological Landscape | 0.86 | 3 |
| D) Integration & Innovation of Education Technology | 0.91 | 3 |

Table 4 KMO and Bartlett's Test

| Dimension | KMO | N of Items |
|---|------|------------|
| A) Personnel management practices | 0.83 | 3 |
| B) Organization Structure & Culture | 0.83 | 3 |
| C) Technological Landscape | 0.83 | 3 |
| D) Integration & Innovation of Education Technology | 0.81 | 3 |

Table 5 Descriptive Statistics

| | Minimum | Maximum | Mean | Std. Deviation |
|---|---------|---------|------|----------------|
| A) Personnel management practices | 1.0 | 5.0 | 3.89 | .85 |
| B) Organization Structure & Culture | 1.0 | 5.0 | 3.84 | .83 |
| C) Technological Landscape | 1.0 | 5.0 | 3.87 | .79 |
| D) Integration & Innovation of Education Technology | 1.0 | 5.0 | 4.13 | .51 |

Organizational Structure and Culture on Educational Technology Integration and Innovation part, conclusion reached that educational institutions face the challenge of integrating and innovating educational technology into their systems in today's digital age (Yang et al., 2010). Organizational structure and culture play a crucial role in facilitating this process, as they provide the foundation and framework for effective implementation of educational technology. Organizational structure refers to the formal arrangement of roles, responsibilities, and reporting relationships within an educational institution. A well-designed organizational structure allows for clear lines of communication, efficient decision-making processes, and effective coordination among different departments and stakeholders involved in the integration of educational technology (Gunawan et al., 2020). Furthermore, organizational structures reflect formal status and power hierarchies in organizations; however, the actual patterns of information flow and collaboration are also strongly affected by their organizational cultures.

Table 6 Systematic Planning of Educational Technology Innovation

| Dimension | Variables | Plan |
|-----------------------------------|----------------------------|---|
| A) Personnel management practices | a1) Recruitment Strategies | Clarify recruitment needs: The system plan needs to specify the professional background, skills, and experience requirements of the required teachers to ensure that the recruited personnel can meet the needs of educational technology innovation. Diversify recruitment channels: In addition to traditional recruitment methods such as campus job fairs and job websites, more innovative and technically capable teachers can be attracted through channels such as social media and professional forums. Strengthen interview evaluation: During the interview process, in addition to assessing the applicant's professional skills and knowledge, attention should also be paid to evaluating their teamwork skills, and ability to adapt to change. |
| | a2) Professional | Provide continuous training: The system program |

| Dimension | Variables | Plan |
|-------------------------------------|--|---|
| | <p>Development</p> <p>a3) Retention Strategies</p> | <p>should provide teachers with regular training on educational technology innovation and the application of new technologies to help them update their knowledge and upgrade their skills.</p> <p>Encourage independent learning: Encourage teachers to use their spare time for independent learning, such as attending online courses, reading related books, etc., and provide certain learning resources and support.</p> <p>Set up research projects: Encourage teachers to participate in or lead educational technology innovation projects to enhance their professional and innovative ability through practice.</p> <p>Provide career development opportunities: The system plan focuses on the comprehensive development of teachers, providing multi-level and multi-form career promotion routes.</p> <p>Create a good working environment: Provide teachers with a comfortable working environment and necessary teaching equipment to ensure that they can efficiently carry out teaching and research work.</p> <p>Strengthen communication and cooperation: Strengthen communication and cooperation between various departments within the system plan, promote resource sharing and complementary advantages, and create a good atmosphere for educational technology innovation.</p> |
| B) Organization Structure & Culture | <p>b1) Hierarchical Structure</p> <p>b2) Communication Channel</p> | <p>Flat Organizational Structure: Reducing the number of management levels allows for more rapid and flexible decision-making. This contributes to accelerating the speed of educational technology innovation as new ideas and solutions can be implemented more quickly.</p> <p>Cross-Departmental Collaboration: Establishing cross-departmental collaboration teams, including system program teachers, system program managers, and IT teachers, to jointly promote educational technology innovation. This collaboration fosters communication and cooperation among individuals with different professional backgrounds, leading to the generation of more innovative ideas.</p> <p>Clear Responsibilities and Roles: In a flat organizational structure, it is important to clarify the responsibilities and roles of each individual to ensure that everyone is aware of their tasks and accountabilities. This helps to improve work efficiency, reduce communication costs, and thereby drive educational technology innovation.</p> <p>Establish Effective Communication Channels: In addition to traditional communication methods such as meetings and emails, modern communication tools (such as instant messaging software, online collaboration platforms, etc.) can be utilized to establish more efficient and convenient communication channels.</p> <p>Regular Communication Meetings: Conduct regular cross-departmental communication meetings to allow individuals from different backgrounds to share their work progress, encountered problems, and solutions. This helps to promote information sharing and collaboration.</p> <p>Encourage Open and Transparent Communication: Establish an open and transparent communication environment that encourages employees to voice their ideas and suggestions. This helps to stimulate employees' innovative spirit and drive educational technology</p> |

| Dimension | Variables | Plan |
|----------------------------|--|---|
| | b3) Collaboration Mechanisms | <p>innovation.</p> <p>Establish a Collaboration Platform: Utilize modern technological tools to create an online collaboration platform that allows personnel from different departments to collaborate and communicate anytime, anywhere. This helps to break geographical and time constraints, improving collaboration efficiency.</p> <p>Establish an Innovation Fund: Create a dedicated educational technology innovation fund to support innovative and practical educational technology projects. This can stimulate employees' enthusiasm for innovation and promote the development of educational technology innovation.</p> <p>Establish an Incentive Mechanism: Reward and recognize individuals or teams who have made outstanding contributions to educational technology innovation. This can encourage more people to participate in educational technology innovation and create a positive atmosphere for innovation.</p> |
| C) Technological Landscape | c1) Available Technologies | <p>Technical Training and Advancement: Provide regular technical training and advancement opportunities for system solution teachers, system solution management personnel, and IT teachers to ensure they are proficient in the latest educational technologies and tools. This can be achieved through internal training, external seminars, online courses, and other methods.</p> |
| | c2) Pace of Technological Advancements | <p>Technology Demonstration and Experience: Organize technology demonstration and experience activities to allow faculty and staff to personally experience the latest educational technologies, such as virtual reality, artificial intelligence, and more. This helps stimulate their interest in new technologies and promote their application in education.</p> <p>Pay Attention to Technological Trends: Encourage system solution faculty and staff to pay attention to technological trends and understand the latest developments in educational technology. This can be achieved by subscribing to industry news, participating in technical seminars, and other methods.</p> |
| | c3) Faculty Technological | <p>Establish a Technology Update Mechanism: Establish a technology update mechanism to ensure that the technological environment of the system solution can keep up with the pace of technological development. This includes regularly updating hardware equipment, upgrading software systems, and introducing new technologies.</p> <p>Technical Demonstration and Experience: Organize technical demonstration and hands-on experience activities to allow faculty and staff to personally engage with the latest educational technologies, such as virtual reality, artificial intelligence, and more. This helps stimulate their interest in new technologies and promote their integration into education.</p> <p>Technology Selection and Evaluation: Establish a mechanism for selecting and evaluating technologies to ensure that the system solutions introduce technologies that align with educational needs and offer practical value. Additionally, conduct regular assessments and optimizations of existing technologies to maintain a continuously updated technological environment.</p> |
| D) Integration | & d1) Level of Technology | <p>Develop Clear Technology Integration Policies and</p> |

| Dimension | Variables | Plan |
|--------------------------|---|---|
| Innovation of Technology | Education Integration | <p>Guidelines: Higher education institutions should formulate explicit technology integration policies that clarify the positioning and role of technology in teaching, research, and management. Publish technology integration guidelines to provide teachers and administrators with a clear framework and steps for technology application.</p> <p>Strengthen Infrastructure Construction: Invest more resources in upgrading and expanding campus networks, data centers, multimedia classrooms, and other infrastructure to ensure smooth technology operation. Establish a unified technology platform to integrate various educational resources, facilitating easy access and usage for teachers and students.</p> <p>Promote Interdisciplinary Technology Integration: Encourage cross-disciplinary technological exchanges and collaborations, applying advanced technologies to teaching and research areas. Establish interdisciplinary technology integration projects to promote deep integration between technology and disciplinary content.</p> <p>Innovation Laboratories: Establish educational technology innovation laboratories to provide teachers with a space to practice new technologies and explore educational innovations. These laboratories will facilitate frequent application and innovative practices in educational technology.</p> <p>Project-Driven Approach: Encourage teachers and administrators to undertake innovative practices by establishing educational technology innovation projects. This will drive continuous development and application of educational technology.</p> <p>Cooperation and Exchange: Strengthen inter-institutional cooperation to promote the exchange of educational technology and innovative practices. Share successful experiences and resources to enhance the overall quality of educational technology implementation.</p> <p>Clarifying Instructional Objectives: When developing educational technology integration strategies, it is crucial to define clear instructional objectives and desired learning outcomes. This ensures that the application of technology enhances teaching quality and learning effectiveness.</p> <p>Skill Development: It is important to strengthen the information literacy and technical skills of both teachers and students. This will enhance their practical abilities and innovative capabilities in the use of educational technology.</p> <p>Evaluation and Feedback: An evaluation mechanism for educational technology applications should be established. Regularly collecting feedback from teachers and students allows for timely adjustments and optimizations of technology application strategies, thus ensuring improved teaching and learning outcomes.</p> <p>Case Sharing: Hosting regular sessions on sharing successful educational technology cases is essential. Promoting excellent teaching practices and innovative achievements can inspire more teachers and students to actively participate in educational technology innovation.</p> |
| | d2) Frequency of innovative Practices | |
| | d3) Teaching and Learning Outcomes Skills | |

Technological Landscape on Educational Technology Integration and Innovation part, conclusion reached that the integration of technology into various aspects of education has become both an opportunity and a challenge in an era marked by rapid technological advancements (Bhat, 2023). The technological landscape positively influences the integration and innovation of educational technology (Zhang, 2014). By analyzing existing literature, empirical data, and case studies, the paper explores the potential benefits and challenges of integrating technology into educational settings and assesses its impact on student achievement and engagement (Bhat, 2023). The integration of technology into education equips students with the digital skills they'll need for their future careers. This thesis contributes to the growing body of literature on educational technology integration by providing empirical evidence of the factors influencing its success within Chinese higher education institutes. By identifying key drivers and barriers, the study offers valuable insights for informing policy and practice aimed at enhancing the quality and efficiency of education through technology integration.

Conclusion

In conclusion, this study provides valuable insights into the integration and innovation of educational technology within Chinese higher education institutes. Through a comprehensive mixed-methods approach, including qualitative exploration, conceptual framework development, empirical quantitative analysis, and strategic planning, the study has shed light on the complex interplay between personal management practices, organizational dynamics, technological landscapes, and technology integration.

Phase 1 delved into the current state of educational technology integration, revealing nuanced perspectives from administrators and faculty. This qualitative exploration unearthed key barriers and facilitators, laying the groundwork for the subsequent phases.

Phase 2 saw the development of a robust conceptual framework, guided by qualitative insights and expert validation. This framework illuminated the dynamic relationships among various factors influencing technology integration, providing a structured basis for empirical investigation.

Phase 3, empirical quantitative analysis validated the hypothesized relationships within the conceptual framework. Through rigorous statistical techniques, the study confirmed the significance of personnel management practices, organizational structure, and technological landscape in shaping technology integration outcomes. Phase 4 culminated in the proposal of a strategic plan aimed at promoting integration and innovation of educational technology. By convening an expert panel and delineating strategic activities, the study outlined actionable steps for institutions to enhance technology integration efforts.

Overall, this study contributes to the growing body of knowledge on educational technology integration in Chinese higher education. Its findings offer practical implications for university administrators, policymakers, and practitioners seeking to leverage technology effectively to enhance teaching, learning, and institutional effectiveness. Moving forward, continued study and implementation of evidence-based strategies will be essential in fostering a culture of innovation and excellence in educational technology integration.

Recommendations

1. To increase the generalizability of the current study. This will provide a more comprehensive understanding of the factors influencing educational technology integration. and provide more targeted guidance for educational institutions in different regions.
2. It is necessary to investigate more deeply the dynamic changes that occur during the process of educational technology integration and innovation. Long-term studies should be used in future studies to monitor the process of educational technology integration and innovation. Analyze dynamic changes and influencing factors.
3. Funding support and training teachers on the integration and innovation of educational technology.

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