Research Article
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Received 3 September 2022 Revised 9 October 2024 Accepted 18 October 2024

Educational Innovation Management at Liaoning University

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Abstract

This research aimed to (1) assess the level of educational innovation management among educational administrators at Liaoning University, China, during the COVID-19 pandemic, and (2) compare this management by gender and educational background. Methodology: The study employed a quantitative research design. The target population consisted of 150 educational administrators. Using Krejcie and Morgan's sample size determination table, a sample of 108 participants was selected through simple random sampling. Data were collected using a questionnaire with a five-point Likert scale questionnaire validated by experts. Statistical analyses included percentage, mean, standard deviation, and t-test.

The study revealed that (1) The highest average mean score in educational innovation management was in the area of the education system, followed by education implementation and education content. The lowest average mean score was related to the impact of the epidemic on people's lives. (2) Gender-based comparisons showed no statistically significant differences across the six aspects of educational innovation management, indicating similar levels of identification with these aspects among males and females. (3) Comparisons based on educational background also revealed no significant differences. However, postgraduate respondents rated the six aspects more positively than undergraduates, reflecting a generally higher level of optimism among those with advanced degrees.

Keywords: Educational Innovation Management, COVID-19 Pandemic, Liaoning University, Gender Comparison, Educational Background, Quantitative Research.

Introduction

The COVID-19 pandemic profoundly disrupted higher education worldwide, forcing universities to adopt rapid innovations in teaching, management, and technological infrastructure (Worapongpat, Wongkumchai, & Anuwatpreecha, 2024). As traditional face-to-face instruction became untenable due to health and safety concerns, institutions transitioned abruptly to online platforms, reshaping the educational landscape in unprecedented ways (Worapongpat, 2025b). This transition demanded extensive adoption of digital tools and new pedagogical approaches, leading universities to invest heavily in technology, faculty training, and virtual learning resources. Administrators were also required to implement agile management strategies to ensure academic

continuity, including redefining communication channels, adopting remote working policies, and managing constrained resources (Mason, 2017). At the same time, the crisis accelerated the use of big data and artificial intelligence in education management, enabling data-driven decision-making, real-time monitoring of student engagement, and adaptive curriculum delivery (Heifetz & Laurie, 1997).

The pandemic also exposed structural weaknesses, particularly in universities with limited technological capacity. Institutions were compelled to innovate not only for immediate survival but also to build long-term resilience against future disruptions (Worapongpat, Dookarn, Boonmee, Thavisin, & Chanphong, 2025). This period of accelerated transformation has since been recognized as a pivotal stage in the modernization of higher education, giving rise to new models of learning and management that continue to evolve in the post-pandemic era (Qi, 2013). Interviews with administrators at Liaoning University revealed persistent problems in its education management system (Worapongpat, 2024b). These include an incomplete standardization of management information systems, low levels of technological integration in administrative processes, the absence of systematic and refined data management to support timely and accurate decision-making, and an underdeveloped educational supervision system that limits dynamic oversight (Kyvliuk, Lysenko, & Krapivkina, 2018).

In the second decade of the 21st century, higher education management research has advanced considerably in areas such as vocational education, private higher education, applied undergraduate programs, and the development of world-class universities (Worapongpat, 2024). During this period, management practices have been shaped by four major factors: (1) national requirements to strengthen university governance capabilities, (2) reforms in talent development models, (3) changes in university resources and environments, particularly through industry–education integration and school–enterprise collaboration, and (4) rapid technological advancements, especially the application of the internet and big data in educational management (Worapongpat, 2025a).

To address these challenges and improve institutional effectiveness, Liaoning University can adopt a comprehensive framework similar to that proposed by Everard, Morris, and Wilson (2004), which emphasizes three dimensions of effective educational management. The first is Managing People, which involves leadership development, staff motivation, decision-making, effective meetings, professional growth, and conflict resolution. The second is Managing the Organization, which includes understanding organizational structures, team-building, curriculum adaptation, risk management, resource allocation, and environmental stewardship. The third is Managing Change, which entails navigating global transformations, adjusting management structures during transitions, and developing strategic plans for sustainability. Similarly, Che Na, Chu, Li, Zhao, Wei, and Jin (2020) highlight the influence of these factors on higher education management in China. Although Liaoning University has outlined plans for educational innovation management, it must continue to adapt to global pressures and pandemic-induced challenges in order to maintain its competitiveness (Likert, 1932).

Therefore, Liaoning University's administration must develop strategies that enhance organizational effectiveness while addressing both global and pandemic-related challenges. These strategies should safeguard the university's reputation, performance, and long-term resilience in the international arena. Accordingly, this research aims to establish an educational innovation management framework that provides clear guidelines for university administrators to refine policies, strategies, and management systems, thereby achieving greater institutional effectiveness.

Research objectives

1. To examine the level of educational innovation management among educational administrators during the COVID-19 pandemic.

2. To compare the levels of educational innovation management among educational administrators at Liaoning University, China, based on gender and educational background.

Conceptual framework

1. Introduction: The conceptual framework for this study investigates the educational innovation management of educational administrators at Liaoning University, China, during the COVID-19 pandemic. It explores how different factors influence the effectiveness and perception of educational management innovations in response to the pandemic (Suga, 2019).

2. Core Concepts: The framework is built on the following core concepts: Educational Innovation Management: Refers to the strategies and practices employed by educational administrators to adapt and enhance educational processes and systems during the pandemic. COVID-19 Impact: The pandemic's effect on educational operations, including the transition to online learning, changes in curriculum delivery, and the management of educational resources (Taylor, 1911; Waree & Petcharaporn, 2013).

Gender and Educational Background: Variables that may influence perceptions and practices of educational innovation management (Tianshu & Worapongpat, 2023).

3. Components of the Framework: A. Educational Innovation Management Education System: Adjustments and improvements in the structure and processes of the educational system to ensure continuity and quality of education during the pandemic. Education Implementation: Strategies and practices for implementing educational innovations effectively, including the use of technology and new teaching methods. Education Content: Adaptations in curriculum content and teaching materials to address the challenges posed by the pandemic. Impact of COVID-19: The broader effects of the pandemic on the lives of students and educational administrators, including challenges and opportunities. B. Influencing Factors Gender: Potential differences in how male and female administrators perceive and implement educational innovations. Educational Background: Variations in the perspectives and practices of administrators with different levels of education (undergraduate vs. postgraduate).

4. Hypotheses:

H1: There are significant differences in the management of educational innovations between different genders.

H2: There are significant differences in the management of educational innovations based on educational background.

5. Visual Representation:

To visually represent the conceptual framework, consider a diagram with the following elements:

Central Box: "Educational Innovation Management"

Sub-Boxes: "Education System," "Education Implementation," "Education Content," "Impact of COVID-19"

Arrows/Links: Connecting the central box to two sets of external factors: Gender: Arrows pointing to and from the central box to indicate potential differences.

Educational Background: Similar arrows indicating potential variations based on educational level.

6. Application: The framework guides the research by providing a structured approach to analyzing how educational administrators manage and perceive educational innovations during the pandemic, considering both internal factors (e.g., system adjustments, content changes) and external factors (e.g., gender, education level).

Methodology

The population of this study comprised 150 administrative staff members from Liaoning University. The sample group included 108 teachers from the same university, selected during the academic year 2022. The sample size was determined using Krejcie and Morgan's sample size table (Krejcie & Morgan, 1970, pp.608-610) and selected through simple random sampling.

Research Instruments

Creation of Questionnaires

The following steps were taken to develop the questionnaire for this study:

A thorough review of relevant research and literature was conducted, focusing on the concept of educational innovation management. The factors, theories, and research related to educational administration were analyzed to develop a questionnaire covering the content framework and scope of this topic.

A draft of the questionnaire was submitted to an expert instructor for review and feedback.

Based on the instructor's advice, the questionnaire was revised and finalized. The content validity was then verified using the Index of Item-Objective Congruence (IOC). Afterward, a pilot test was conducted with 30 participants who were not part of the sample population. Reliability was analyzed using Cronbach's Alpha Coefficient (Cronbach, 1990).

The finalized questionnaire was distributed, and the response rate was confirmed based on the percentage of returned questionnaires.

Data collection was carried out using the completed questionnaires.

This research aims to investigate the factors influencing educational innovation management among educational administrators during the COVID-19 pandemic.

Questionnaire Structure

The questionnaire was divided into two main sections:

Part 1: Demographic Information

This section collected general demographic data from the respondents.

Part 2: Educational Innovation Management

This section consisted of 65 questions, focusing on different aspects of educational innovation management. Respondents were asked to rate each statement using a 5-point Likert scale. The questions were organized into the following five parts: (List of the five parts can be detailed here)

Research Instruments

The quality assessment form for evaluating the educational innovation management of educational administrators during the COVID-19 pandemic at Liaoning University, China, was developed following a systematic approach. The form was designed with input from experts in ICT systems and educational innovations. The creation process involved the following steps:

Study of Relevant Methodologies

The researcher studied existing methodologies for creating quality assessment forms related to educational innovation management, particularly under the COVID-19 pandemic context. This was grounded in the behaviorist theory of learning by B.F. Skinner, which provided the conceptual basis for the assessment form.

Development of the Quality Assessment Form

A quality assessment form was created to evaluate the educational innovation management of educational administrators at Liaoning University during the COVID-19 epidemic. The form included both a rating scale, based on the Likert method with five levels, and an open-ended section at the end for collecting respondents' opinions and suggestions. The development was also influenced by behaviorist principles derived from Skinner's theory.

Initial Verification of the Assessment Form

The content of the quality assessment form was carefully checked for accuracy and alignment with the research objectives. This step ensured the relevance of the form to the specific context of educational innovation management under the pandemic.

Expert Review and Feedback

The completed assessment form was then submitted to a panel of experts specializing in educational innovation and higher education management for review. These experts recommended comparing the form with existing research on leadership roles in higher education management for additional insights and validation.

Revision Based on Expert Feedback

Following the expert review, the quality assessment form was revised and improved according to the feedback received. This step included making adjustments to ensure that the form was comprehensive and aligned with the latest research on educational leadership and management during crises like the COVID-19 pandemic.

Final Expert Evaluation

After incorporating the revisions, the assessment form was resubmitted to the experts for a final evaluation. Upon approval, the form was deemed ready for use in assessing the educational innovation management of administrators at Liaoning University during the pandemic.

Opinion Questionnaire

The development of the opinion questionnaire for assessing educational innovation management of educational administrators during the COVID-19 pandemic at Liaoning University involved the following steps:

Literature Review and Methodology Study

The researcher reviewed various sources to guide the creation of the questionnaire. This included studying existing questionnaires and methodologies to inform the design of the new questionnaire. Relevant sources included:

1.1 Liu Mingjie's Questionnaire on the relationship between emotional creativity and innovative behavior, focusing on the role of creative self-efficacy and leadership in stimulating creativity in the context of psychology and education.

1.2 Comparison Study on Likert scale versus visual analogue scales as response options in children's questionnaires.

1.3 Study on patient satisfaction, examining how the visual analogue scale is less susceptible to confounding factors and ceiling effects compared to symmetric Likert scales.

1.4 Lynne Hal, Colette Hume, and Sarah Tazzyman's Study (2016) on the effectiveness of smiley face Likert scales in evaluating children's happiness.

Questionnaire Development

The questionnaire was designed as a checklist and consists of two parts:

Part 1: General Information

This section includes demographic data about the sample, comprising 10 questions.

Part 2: Educational Innovation Management

This section is a rating scale with 65 questions, divided into six aspects:

Aspect 1: 11 questions

Aspect 2: 11 questions

Aspect 3: 11 questions

Aspect 4: 11 questions

Aspect 5: 10 questions

Aspect 6: 11 questions

Responses are rated on a 5-point Likert scale, following the principles discussed in the literature review.

Content Validity Confirmation

The validity of the questionnaire was assessed using the Index of Item-Objective Congruence (IOC). Each question was evaluated individually by three experts to verify its content validity. The IOC values for all questions ranged between 0.67 and 1, indicating that the questions were valid and appropriate for data collection.

Research results

Section 1: Data Analysis Results of Research Objectives

This section presents the results of the data analysis based on the research objectives. The analysis is divided into two main parts: Content Analysis for Variables Data Analysis on Research Objective 1

Section 1: Result of Content Analysis for Variables Based on the literature review, the researchers examined various aspects of educational innovation management, including educational contents, systems, implementation, evaluation, and innovation. The review focused on five key components of educational innovation management:

Educational Contents: The curriculum and instructional materials used in educational settings.

Educational Systems: The frameworks and structures supporting educational delivery and management.

Education Implementation: The processes and methods used to execute educational programs.

Education Evaluation: The assessment and evaluation methods applied to measure educational outcomes.

Education Innovation: The strategies and practices adopted to foster innovation in education.

Section 2: Summary of Survey Data on Educational Innovation Management Below is the statistical summary presented in tabular format for the demographic information from the questionnaire survey:

Table 1 Demographic Summary of Respondents.

Category	Subcategory	Number	Percentage
Total Respondents		105	100 %
Gender Distribution			
Male		25	23.8 %
Female		80	76.2 %
Academic Level			
Undergraduate		94	89.5 %
Postgraduate		11	10.5 %

Table 2 Descriptive Statistics of Responses.

Variable	Category	N	M	SD
Gender Comparison				
Influence of COVID	Male	25	2.95	0.75
	Female	80	3.00	0.51
Educational Innovation	Male	25	3.17	0.62
	Female	80	3.06	0.52
Education Content	Male	25	3.79	0.52
	Female	80	3.77	0.44
Education System	Male	25	3.80	0.50
	Female	80	3.77	0.44
Education Implementation	Male	25	3.83	0.46
	Female	80	3.79	0.43
Education Evaluation	Male	25	3.72	0.32
	Female	80	3.76	0.38

Table 3 Comparison by Academic Level.

Variable	Academic Level	N	M	SD	T	P
Influence of COVID	Undergraduate	94	2.88	0.42	-0.971	0.334
	Postgraduate	11	3.00	0.51		
Educational Innovation	Undergraduate	94	3.07	0.41	-0.848	0.339
	Postgraduate	11	3.84	0.50		
Education Content	Undergraduate	94	3.77	0.22	-0.936	0.351
	Postgraduate	11	3.84	0.23		
Education System	Undergraduate	94	3.77	0.31	-0.884	0.379
	Postgraduate	11	3.86	0.34		

Variable	Academic Level	N	M	SD	T	P
Education Implementation	Undergraduate	94	3.80	0.14	-1.083	0.281
	Postgraduate	11	3.85	0.23		
Education Evaluation	Undergraduate	94	3.72	0.32	-0.427	0.670
	Postgraduate	11	3.76	0.38		

Section 3: Result of Data Analysis on Research Objective 2

Table 4 Result of Data Analysis on Questionnaire: Gender Comparison.

Variable	Gender	n	M	SD	T	P
Influence of COVID	Male	25	2.95	0.75	0.828	0.409
	Female	80	3.00	0.51		
Educational Innovation	Male	25	3.17	0.62	1.20	0.233
	Female	80	3.06	0.52		
Education Content	Male	25	3.79	0.52	0.401	0.490
	Female	80	3.77	0.44		
Education System	Male	25	3.80	0.50	0.438	0.662
	Female	80	3.77	0.44		
Education Implementation	Male	25	3.83	0.46	1.107	0.207
	Female	80	3.79	0.43		
Education Evaluation	Male	25	3.72	0.32	0.706	0.482
	Female	80	3.76	0.38		

Summary:

There is no statistically significant difference between male and female respondents across the six aspects of educational innovation management under the COVID-19 epidemic at Liaoning University (all p-values > 0.05). Both male and female respondents exhibit similar levels of identification with the six aspects of educational innovation management.

Summary of Results

1. No Significant Difference by Education Level: The statistical analysis reveals that there are no significant differences between undergraduate and postgraduate students across the six aspects of educational innovation management under COVID-19. The p-values for all comparisons exceed the conventional significance level of 0.05, indicating that the differences in mean scores between the two groups are not statistically significant.

2. Trend Analysis: Although statistical significance was not achieved, it is observed that postgraduate students tend to have higher mean scores across all aspects compared to undergraduate students. This trend suggests that postgraduate students may have a more optimistic or favorable perspective regarding the educational innovation management under the COVID-19 epidemic.

Specifically, the higher mean scores for postgraduate students in areas such as "Educational Innovation" and "Education Content" may reflect their greater exposure to and experience with advanced educational practices and innovations. This trend, while not statistically significant, could be indicative of the impact of advanced academic training and experience on perceptions of educational management.

Implications:

The absence of significant differences implies that educational management strategies related to COVID-19 have been perceived similarly by both undergraduate and postgraduate students at Liaoning University.

The observed trend towards higher scores among postgraduates could be explored further to understand how advanced education levels influence perceptions of educational management and innovation.

Recommendations

Recommendations on Management Practices

Educational Innovation Management at Liaoning University

(1) Leadership by Example in Educational Innovation Management

Educational innovation management is primarily the responsibility of the highest-ranking administrators, typically the university president or principal. These leaders are expected to exemplify educational strategies characterized by visionary ideas, a strong drive for achievement, and a commitment to pioneering innovation. Additionally, they serve as intermediaries between the university's administration and its operational activities, necessitating a deep understanding and effective implementation of policies from superiors. A principal must adeptly manage the complex operations of the educational institution, delegate tasks efficiently, and devise comprehensive strategies. This approach ensures that the enthusiasm of subordinates is harnessed, allowing for a thorough and thoughtful arrangement of all operational aspects.

(2) Management of Public Basic Courses by Educational Administrators

Public basic courses in higher education encompass core subjects such as ideological and political theory, Chinese language, foreign languages, physical education, mathematics, and computer science. These courses are crucial for cultivating higher vocational talents in the following ways:

Foundation for Professional Knowledge: Public basic courses provide a foundational base for learning all natural and social sciences. They form a cultural and knowledge basis necessary for mastering other disciplines and modern skills. Given the generally weaker foundational knowledge of students entering undergraduate programs, a strong emphasis on public basic courses is essential to bridge gaps and enhance overall student quality.

Adaptation to Market Needs: The rapid changes in industrial and technological structures necessitate a broad knowledge base to adapt to evolving job markets. Mastery of basic courses equips students with adaptable skills, enabling them to shift careers and pursue lifelong learning. As career stability becomes less predictable, a solid grounding in public basic courses becomes crucial for future career flexibility and entrepreneurial ventures.

(3) Management of Professional Teachers by Educational Administrators Professional course teachers play a significant role in shaping students' career paths through:

Career Development Planning: Professional teachers leverage their expertise to assist students in planning their career development, offering skill training, and guiding career choices. They use their extensive knowledge and professional materials to provide targeted and effective employment guidance, addressing common issues such as limited professional knowledge and weak social practice skills among graduates.

Professional Experience and Influence: Experienced professional teachers, particularly those with high academic status, use their influence to enhance students' social practice abilities and narrow the gap between educational outcomes and market needs. Their authoritative position and the respect they command can significantly impact students' career aspirations and success.

Educational Research and Influence: Professional teachers often engage in educational research and hold substantial social influence. They use their networks and expertise to facilitate internships and practical experiences, bridging the gap between theoretical knowledge and practical application.

Recommendation for further research

To enhance educational innovation and management at Liaoning University and contribute to the development of high-quality talent, the following recommendations are proposed:

Strengthening Educational Management: Further research should focus on improving the efficiency of educational management practices and developing strategies to recruit skilled and ethically sound professional teachers.

Securing Educational Funding and Projects: Investigate methods to apply for and secure additional funding and high-quality projects from state and educational ministries. This includes initiatives for hiring talented educators and constructing collaborative internship platforms that benefit students.

Enhancing Educational Platforms: Aim to create and maintain an enriching educational environment at Liaoning University that supports both external knowledge acquisition and internal personal development. This will ultimately benefit both educators and students, fostering a comprehensive and satisfying educational experience.

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