

The Enhancement Guidelines for Freshmen Interdisciplinary Learning Ability at Guangxi Minzu University

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Abstract: The objectives of this research were 1) to study the current situation of interdisciplinary learning ability of freshmen at Guangxi Minzu University and 2) to propose enhancement guidelines for freshmen's interdisciplinary learning ability. The sample consisted of 368 freshmen selected by accidental random sampling, while 5 teachers and administrators were selected for interviews using purposive sampling. The research instruments were a questionnaire and a structured interview form. Quantitative data were analyzed using frequency, percentage, mean, and standard deviation, while interview data were analyzed using content analysis. The results revealed that 1) the overall interdisciplinary learning ability of freshmen was at a high level. Among the five components, Increased Adaptability ranked highest, followed by Integration of Knowledge, Improved Problem-Solving, Application of Knowledge, and Knowledge Creation, respectively. 2) The enhancement guidelines included integrating interdisciplinary learning into the freshmen curriculum; promoting interdisciplinary projects, problem-based learning, and real-world experiences; strengthening collaboration across disciplines; providing flexible learning environments supported by technology; and establishing continuous reflection, feedback, and evaluation. Particular emphasis should be placed on Knowledge Creation, Application of Knowledge, and Improved Problem-Solving while maintaining strengths in Integration of Knowledge and Increased Adaptability.

Keywords: Interdisciplinary learning ability, Freshmen, Knowledge integration, Knowledge application, Guangxi Minzu University.

1. Introduction

Since the 21st century, China's news media industry, particularly radio and television, has undergone rapid development alongside the expansion of professional education in Radio and Television Editing and Directing. However, the growth of the Internet, digital technologies, artificial intelligence, and multi-platform communication has transformed the traditional media industry and created new competency requirements for future media professionals. Graduates are increasingly expected to possess not only specialized knowledge but also the ability to integrate and apply knowledge across disciplines, generate innovative ideas, solve complex problems, and adapt to changing environments.

In response to these transformations, the Chinese Ministry of Education has promoted undergraduate education reform, emphasizing interdisciplinary education, innovative talent cultivation, educational resource integration, and improved teaching quality. These directions are particularly relevant to Radio and Television Editing and Directing, an application-oriented discipline that requires knowledge and skills from communication, digital technology, visual arts, media production, and creative planning. Therefore, interdisciplinary learning ability is essential for freshmen in establishing a strong foundation for academic study and future professional development. In this study, interdisciplinary learning ability comprises five components: Integration of Knowledge, Application of Knowledge, Knowledge Creation, Improved Problem-Solving, and Increased Adaptability.

However, traditional teaching practices often emphasize discipline-specific knowledge and theoretical instruction, with limited opportunities for interdisciplinary collaboration, authentic learning, and real-world problem-solving. Consequently, freshmen may experience difficulties in connecting knowledge across disciplines, applying knowledge to practical situations, creating innovative ideas, and adapting to new learning and professional contexts. Effective interdisciplinary learning therefore requires not only individual learning ability but also supportive curricula, collaborative learning environments, practical experiences, and institutional support.

Guangxi Minzu University has developed a foundation for interdisciplinary education through its "Language + Major" educational model, interdisciplinary curricula, industry-education collaboration, and international cooperation with ASEAN countries. Nevertheless, systematic guidelines for enhancing freshmen's interdisciplinary learning ability remain necessary. Therefore, this study aims to examine the current situation

and propose enhancement guidelines for freshmen's interdisciplinary learning ability at Guangxi Minzu University. The proposed guidelines focus on strengthening the five components of interdisciplinary learning ability and supporting the development of students who can effectively respond to the changing demands of the contemporary media industry and society.

2. Research Objective

1. To study the current situation of interdisciplinary learning ability of Freshmen at Guangxi Minzu University
2. To propose the enhancement guidelines for interdisciplinary learning ability of Freshmen at Guangxi Minzu University

3. Research Methodology

This study adopts a mixed-methods approach combining quantitative and qualitative methods. The questionnaire is designed to investigate the current situation of freshmen's interdisciplinary learning ability at Guangxi Minzu University across five components: Integration of Knowledge, Application of Knowledge, Knowledge Creation, Improved Problem-Solving, and Increased Adaptability. The questionnaire is administered to 368 freshmen at Guangxi Minzu University. Following the questionnaire, structured interviews are conducted to obtain deeper insights and recommendations for developing enhancement guidelines for freshmen's interdisciplinary learning ability. The interview participants consist of five teachers and administrators from Guangxi Minzu University, selected through purposive sampling based on their relevant academic experience and expertise. The quantitative and qualitative findings are then synthesized to formulate appropriate enhancement guidelines for freshmen's interdisciplinary learning ability at Guangxi Minzu University.

3.1 Population and Sample Group

This study involves a population of freshmen at Guangxi Minzu University. A sample of 368 freshmen was selected through accidental random sampling to investigate their interdisciplinary learning ability. Additionally, qualitative data were collected through structured interviews with five teachers and administrators from Guangxi Minzu University, selected using purposive sampling based on their relevant academic experience and expertise. The interviews aimed to obtain expert opinions and recommendations for developing comprehensive enhancement guidelines for freshmen's interdisciplinary learning ability in five components: Integration of Knowledge, Application of Knowledge, Knowledge Creation, Improved Problem-Solving, and Increased Adaptability.

3.2 Research instruments and Construction

The questionnaire was developed based on the research objectives, conceptual framework, and relevant theories and studies on interdisciplinary learning ability. It was designed to assess five components: Integration of Knowledge, Application of Knowledge, Knowledge Creation, Improved Problem-Solving, and Increased Adaptability. The questionnaire was distributed online to 368 freshmen at Guangxi Minzu University using accidental random sampling. Before the main data collection, the questionnaire was examined by experts for content validity using the Index of Item-Objective Congruence (IOC) and pilot-tested with 30 students to determine its reliability using Cronbach's alpha coefficient. All questions display consistency with the measurement target as evidenced by an average score of 0.67 to 1.00 on the acceptable consistency index (IOC).

The structured interview form consisted of open-ended questions designed to obtain deeper opinions and recommendations regarding the enhancement of freshmen's interdisciplinary learning ability. The interview questions were developed based on the five components of interdisciplinary learning ability and the quantitative findings from the questionnaire. Five teachers and administrators at Guangxi Minzu University were selected using purposive sampling based on their relevant academic experience and expertise. The interviewees were informed of the questionnaire findings before the interviews to provide context for their responses. The interviews were conducted individually, either online or face-to-face, and the data were transcribed and analyzed using content analysis to formulate enhancement guidelines for freshmen's interdisciplinary learning ability at Guangxi Minzu University.

3.3 Data Collection

The data were collected through a questionnaire developed based on the research objectives, literature review, conceptual framework, and relevant theories of interdisciplinary learning ability. The questionnaire covered five components: Integration of Knowledge, Application of Knowledge, Knowledge Creation, Improved Problem-Solving, and Increased Adaptability. The questionnaire was distributed online to freshmen at Guangxi Minzu University through digital platforms. A total of 368 valid questionnaires were collected using

accidental random sampling. Before the main data collection, the questionnaire was examined for content validity by experts and pilot-tested with 30 students to ensure its reliability.

The interview data were collected from five teachers and administrators at Guangxi Minzu University, selected using purposive sampling based on their relevant academic experience and expertise. Structured interviews were conducted either online or face-to-face according to the participants' availability. The interview data were transcribed, organized, and analyzed using content analysis to identify key themes, recommendations, and appropriate enhancement guidelines for freshmen's interdisciplinary learning ability at Guangxi Minzu University.

3.4 Data Analysis

The data analysis for this study was conducted in three parts to analyze both quantitative and qualitative data. Part I analyzed the demographic information of the respondents, including gender, faculty, academic program, and participation in interdisciplinary learning activities. The data were analyzed using statistical software and presented using frequency and percentage.

Part II analyzed the current situation of freshmen's interdisciplinary learning ability across five components: 1) Integration of Knowledge, 2) Application of Knowledge, 3) Knowledge Creation, 4) Improved Problem-Solving, and 5) Increased Adaptability. A 5-point Likert scale was used, with the following interpretation: 4.50–5.00 = the highest level, 3.50–4.49 = high level, 2.50–3.49 = moderate level, 1.50–2.49 = low level, and 1.00–1.49 = the lowest level, based on Likert (1932). The data were analyzed using mean and standard deviation, and the results were interpreted and ranked accordingly.

Part III analyzed the qualitative data obtained from structured interviews with five teachers and administrators. The interview data were analyzed using content analysis. The responses were coded, categorized, and grouped into key themes according to the five components of interdisciplinary learning ability. The findings were then synthesized to develop appropriate enhancement guidelines for freshmen's interdisciplinary learning ability at Guangxi Minzu University.

3.5 Research Variable

Based on a comprehensive review and synthesis of the existing literature on the development of students' interdisciplinary learning ability (Linn, 2006; Repko & Szostak, 2017), this study conceptualizes interdisciplinary learning ability as comprising five key dimensions: knowledge integration (Linn, 2006; Repko & Szostak, 2017), knowledge application (Kolb, 1984; Anderson & Krathwohl, 2001), knowledge creation (Nonaka & Takeuchi, 1995), advanced problem-solving competence (Jonassen, 2000; Facione, 1990), and adaptive capacity (Martin et al., 2012; Rudolph et al., 2017).

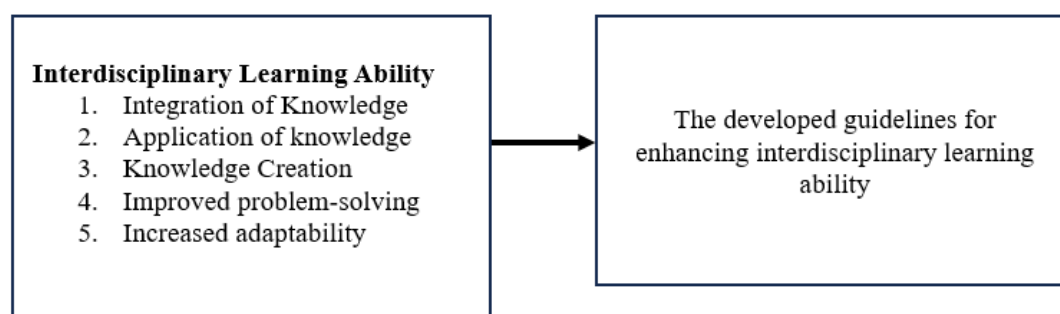


Figure 1: Research Framework

4. Research Findings

Part 1: The Data Analysis on the Current Situation of Freshmen's Interdisciplinary Learning Ability at Guangxi Minzu University

The data on the current situation of freshmen's interdisciplinary learning ability at Guangxi Minzu University were analyzed using statistical methods, including frequency, percentage, mean, and standard deviation. The results were interpreted according to the defined levels and ranked based on the mean scores. To illustrate the current situation of freshmen's interdisciplinary learning ability at Guangxi Minzu University, five components were examined: 1) Integration of Knowledge, 2) Application of Knowledge, 3) Knowledge Creation, 4) Improved Problem-Solving, and 5) Increased Adaptability. Data analysis was shown in Tables 1

Table 1: The mean ($\bar{x}$) and standard deviation (S.D.) the current level of for Freshmen Interdisciplinary Learning Ability at Guangxi Minzu University

(n = 368)			
Interdisciplinary Learning Ability	$\bar{x}$	S.D.	Level
1. Increased Adaptability	4.61	0.45	Highest
2. Integration of Knowledge	4.55	0.48	Highest
3. Improved Problem-Solving	4.48	0.51	High
4. Application of Knowledge	4.42	0.53	High
5. Knowledge Creation	4.35	0.57	High
Total	4.48	0.51	High

According to Table 1, the overall level of freshmen's interdisciplinary learning ability at Guangxi Minzu University was at a high level ($\bar{x}$ = 4.48, S.D. = 0.51). When considering each component, Increased Adaptability had the highest mean score and was at the highest level ($\bar{x}$ = 4.61, S.D. = 0.45), followed by Integration of Knowledge, which was also at the highest level ($\bar{x}$ = 4.55, S.D. = 0.48), whereas, Knowledge Creation had the lowest mean score among the five components ($\bar{x}$ = 4.35, S.D. = 0.57).

Part 2: An Interview Analysis on the Enhancement Guidelines for Interdisciplinary Learning Ability of freshmen at Guangxi Minzu University

The following section presents an analysis of interviews conducted with selected expert teachers and administrators from Guangxi Minzu University. The interviews aimed to explore appropriate enhancement guidelines for the five components of freshmen's interdisciplinary learning ability: 1) Integration of Knowledge, 2) Application of Knowledge, 3) Knowledge Creation, 4) Improved Problem-Solving, and 5) Increased Adaptability. The interview findings were analyzed and synthesized to identify practical teaching and learning approaches for enhancing freshmen's interdisciplinary learning ability.

1. The Enhancement Guideline for "Integration of Knowledge"

Experts suggested that the university should provide systematic interdisciplinary learning opportunities that enable freshmen to connect and integrate knowledge from different subjects. Appropriate approaches include interdisciplinary projects, problem-based learning, case studies, reflective activities, interdisciplinary workshops, and collaboration among teachers from different disciplines. These activities can help students recognize relationships among disciplines, reflect on their learning, and apply multiple perspectives to understand complex issues.

2. The Enhancement Guideline for "Application of Knowledge"

Experts suggested that freshmen should be provided with more opportunities to apply interdisciplinary knowledge in practical and real-world contexts. The university should promote project-based learning, problem-based learning, case studies, practical tasks, and reflective activities. These approaches can help students select appropriate knowledge from different disciplines, adapt it to different situations, and improve their ability to transfer classroom knowledge to practical contexts.

3. The Enhancement Guideline for "Knowledge Creation"

Experts suggested that the university should encourage freshmen to combine, analyze, and synthesize knowledge from different disciplines to generate new ideas and solutions. Appropriate approaches include interdisciplinary projects, inquiry-based learning, creative problem-solving activities, collaborative learning, and innovation-based tasks. Open-ended learning activities and collaboration with students from different academic backgrounds should also be encouraged to promote creativity and the development of new knowledge.

5. The Enhancement Guideline for "Improved Problem-Solving"

Experts suggested that freshmen should have more opportunities to address complex and unfamiliar problems requiring knowledge and skills from multiple disciplines. The university should employ problem-based learning, real-world case studies, interdisciplinary projects, simulations, and creative problem-solving activities. These approaches can encourage students to analyze problems from multiple perspectives, generate alternative solutions, and evaluate and improve their solutions based on outcomes.

6. The Enhancement Guideline for “Increased Adaptability”

Experts suggested that the university should provide freshmen with diverse and flexible learning experiences that expose them to new knowledge, technologies, learning environments, and unfamiliar situations. Appropriate strategies include experiential learning, interdisciplinary projects, simulations, technology-enhanced learning, and reflective activities. These experiences can help students adjust their learning strategies, respond effectively to change, learn from unfamiliar experiences, and transfer their learning to future situations.

5. Conclusion and Discussion

The enhancement of freshmen’s interdisciplinary learning ability at Guangxi Minzu University is discussed as follows:

1. The overall interdisciplinary learning ability of freshmen at Guangxi Minzu University was at a high level. Among the five components, Increased Adaptability ranked highest, followed by Integration of Knowledge, Improved Problem-Solving, Application of Knowledge, and Knowledge Creation, respectively. This result may be explained by the fact that freshmen are entering a new university environment that exposes them to new knowledge, technologies, learning approaches, and diverse academic perspectives. Guangxi Minzu University also provides interdisciplinary courses, practical learning platforms, and opportunities for learning across disciplinary boundaries. This finding is consistent with Martin et al. (2012), who explained that adaptability involves cognitive, behavioral, and emotional adjustment to new and changing situations. Rudolph et al. (2017) also associated adaptability with successful performance in education and work, while Santiani et al. (2024) found that interdisciplinary learning can enhance students’ interdisciplinary thinking.
2. Based on the quantitative findings and qualitative insights from expert teachers and administrators, enhancement guidelines were developed for the five components of freshmen’s interdisciplinary learning ability. The guidelines focus particularly on strengthening Knowledge Creation, Application of Knowledge, and Improved Problem-Solving, while continuing to develop students’ strengths in Integration of Knowledge and Increased Adaptability. The discussions are presented as follows:
 - 2.1 Integration of Knowledge For Integration of Knowledge, experts suggested providing systematic opportunities for freshmen to connect knowledge and concepts from different disciplines. Although this component was at the highest level, students still required further support in reflecting on their learning and recognizing relationships among ideas from different subjects. Therefore, interdisciplinary projects, problem-based learning, case studies, reflective learning, and collaboration among different disciplines should be incorporated into teaching. This approach is consistent with Linn (2006), who emphasized that knowledge integration involves connecting new ideas with prior knowledge and reorganizing understanding, and Repko and Szostak (2017), who emphasized integrating insights from different disciplines to develop a more comprehensive understanding.
 - 2.2 Application of Knowledge For Application of Knowledge, experts recommended providing more opportunities for freshmen to apply interdisciplinary knowledge in different practical and real-world contexts. The findings showed that students particularly needed improvement in adjusting their knowledge according to different situations. Therefore, project-based learning, real-world problem-solving, practical tasks, case studies, and experiential learning should be emphasized. This finding is consistent with Kolb (1984), who emphasized learning through concrete experience, reflection, conceptualization, and active experimentation. Such experiences can help students transfer classroom knowledge into unfamiliar and practical situations.
 - 2.3 Knowledge Creation For Knowledge Creation, experts emphasized strengthening freshmen’s ability to transform existing knowledge and experiences into new knowledge, ideas, and innovative solutions. This component had the lowest mean score among the five components, indicating a particular need for further development. Therefore, interdisciplinary projects, inquiry-based learning, open-ended tasks, creative problem-solving, innovation-based activities, and collaborative learning should be promoted. This finding is consistent with Nonaka and Takeuchi (1995), who explained that knowledge creation occurs through the transformation and interaction of existing knowledge and experiences. Thus, learning environments should provide opportunities for students to exchange, synthesize, and transform interdisciplinary knowledge into new ideas.
 - 2.4 Improved Problem-Solving For Improved Problem-Solving, experts suggested providing freshmen with opportunities to solve unfamiliar and complex problems requiring knowledge from multiple disciplines. Students demonstrated a high level of problem-solving ability but required further development in generating creative solutions and evaluating their effectiveness. Therefore, problem-based learning, interdisciplinary projects, real-world case studies, simulations, and creative problem-solving activities should be implemented. This finding is consistent with Jonassen (2000), who

emphasized that complex and ill-structured problems require learners to analyze information from multiple perspectives and develop alternative solutions.

- 2.5 Increased Adaptability For Increased Adaptability, experts recommended exposing freshmen to diverse and changing learning situations requiring them to adjust their knowledge, strategies, and approaches. Although this component ranked highest, students still needed opportunities to learn from unfamiliar experiences and transfer their learning to future situations. Therefore, experiential learning, interdisciplinary projects, simulations, technology-enhanced learning, and reflective activities should be provided. This finding is consistent with Martin et al. (2012), who explained that adaptability involves adjusting thoughts, behaviors, and emotions in response to novelty, change, and uncertainty.

6. Recommendations

6.1 Recommend for Implications

- 1) The research indicates that strengthening Knowledge Creation requires more opportunities for freshmen to transform interdisciplinary knowledge into new ideas and innovative outcomes. Therefore, educators should integrate interdisciplinary projects, inquiry-based learning, open-ended tasks, and creative problem-solving activities into courses to encourage students to analyze and synthesize knowledge from different disciplines and generate new knowledge or solutions.
- 2) The research results indicate that improving Application of Knowledge requires students to experience authentic situations in which knowledge from different disciplines can be transferred and adapted. Therefore, educators should incorporate project-based learning, real-world case studies, practical tasks, and experiential learning into courses to help freshmen select, apply, and adjust interdisciplinary knowledge according to different situations and contexts.
- 3) The findings show that strengthening Improved Problem-Solving requires repeated opportunities to address unfamiliar and complex problems from multiple disciplinary perspectives. As a result, educators should design problem-based learning, interdisciplinary projects, simulations, and real-world problem-solving activities that encourage freshmen to generate alternative solutions, evaluate their effectiveness, and improve their approaches when necessary.
- 4) The findings suggest that freshmen demonstrate strong Integration of Knowledge, but further support is needed to help them reflect on their learning and recognize connections among ideas from different subjects. Therefore, educators should integrate reflection journals, concept mapping, interdisciplinary discussions, case studies, and post-project reflection into learning activities to strengthen students' ability to systematically connect and integrate knowledge across disciplines.
- 5) The findings indicate that Increased Adaptability was the strongest component; however, freshmen still need opportunities to learn from unfamiliar experiences and transfer their learning to future situations. Therefore, the university should provide diverse and flexible learning experiences through interdisciplinary projects, simulations, field-based activities, technology-enhanced learning, and reflective activities to help students adapt to new knowledge, technologies, learning environments, and changing situations.

6.2 Future Research

- 1) Freshmen's interdisciplinary learning ability and its enhancement guidelines should be studied longitudinally to assess the effectiveness and long-term impact of the proposed enhancement strategies at Guangxi Minzu University.
- 2) Freshmen's interdisciplinary learning ability should be studied in comparison with other universities to identify effective practices, similarities, differences, and contextual factors influencing the development of interdisciplinary learning ability.
- 3) Research should examine the relationship between specific enhancement strategies (e.g., interdisciplinary projects, problem-based learning, experiential learning, and reflective activities) and measurable changes in freshmen's interdisciplinary learning ability.
- 4) Research should examine the relationship between freshmen's participation in interdisciplinary learning activities and their levels across the five components: Integration of Knowledge, Application of Knowledge, Knowledge Creation, Improved Problem-Solving, and Increased Adaptability.
- 5) Research should examine the relationship between faculty collaboration and interdisciplinary teaching practices and the effectiveness of the proposed enhancement guidelines for freshmen's interdisciplinary learning ability at Guangxi Minzu University.

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