A CASE STUDY OF THE IMPACT OF RESOURCE ALLOCATION STRATEGIES ON ACADEMIC PROGRAM EFFECTIVENESS AT DONGHAI INSTITUTE OF EDUCATION

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This Independent Study Has Been Approved as a Partial Fulfillment of the Requirements for the Degree of Master of Business Administration

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Title: A Case Study of the Impact of Resource Allocation Strategies on Academic Program Effectiveness at Donghai Institute of Education

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Major: Education Resource Management

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ABSTRACT

In the context of ongoing reform in China's higher education sector, resource allocation has become a critical factor influencing the performance and quality of academic programs, particularly in private institutions with limited resources. Donghai Institute of Education, a mid-sized private college, has been striving to improve academic outcomes through strategic internal resource management. This study examined the impact of resource allocation strategies, specifically faculty allocation, infrastructure investment, and learning technology resources, on academic program effectiveness, using Input-Output Theory as its conceptual framework.

The objectives of the study were to examine the relationship between faculty allocation, infrastructure investment, and learning technology resources and the effectiveness of academic programs. A quantitative research design was employed. Data were collected through a structured questionnaire distributed to a stratified random sample of 320 respondents, including faculty and undergraduate students. The instrument measured perceptions of the three input variables and one output variable using a 5-point Likert scale. Descriptive statistics were used to analyze respondent profiles, while Pearson's correlation and multiple linear regression were applied to test the study's hypotheses.

The findings revealed that all three independent variables had a statistically significant and positive relationship with academic program effectiveness. Among them, learning technology resources showed the strongest influence, followed by faculty allocation and infrastructure investment. These results suggest that effective

program outcomes are strongly associated with the quality and strategic deployment of institutional resources.

The study concludes that academic program effectiveness improves when faculty are appropriately assigned, infrastructure is adequately maintained, and learning technologies are fully integrated into instruction. It is recommended that institutions prioritize data-driven resource planning, with particular focus on enhancing digital learning environments and balancing faculty workloads. These findings may guide education administrators and policymakers in improving institutional effectiveness through optimized resource management.

Keywords: faculty allocation, learning technology resources, infrastructure investment, academic program effectiveness

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LI XINYAO

DECLARATION

I, LI XINYAO, hereby declare that this Independent Study entitled “A CASE STUDY OF THE IMPACT OF RESOURCE ALLOCATION STRATEGIES ON ACADEMIC PROGRAM EFFECTIVENESS AT DONGHAI INSTITUTE OF EDUCATION” is an original work and has never been submitted to any academic institution for a degree.

(LI XINYAO)
April 2, 2025

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Chapter 1 Introduction

1.1 Background of the Study

In recent years, the effectiveness of academic programs has become a core indicator of institutional quality in higher education, particularly within educational institutions aiming to optimize limited resources for maximal educational outcomes. With the growing competition in the education sector and increasing demands for accountability, the strategic allocation of resources such as faculty, infrastructure, and learning technologies has attracted extensive academic and administrative attention (Zhang & Wang, 2020).

Input-Output Theory, initially developed in economics to understand production systems, has found increasing relevance in educational research, where educational institutions are conceptualized as systems that transform inputs (resources) into outputs (student learning outcomes and program effectiveness) (Hanushek & Woessmann, 2020). Within this framework, the effectiveness of academic programs is seen not merely as a result of curriculum design or assessment tools, but as a complex function of how resources are allocated and utilized within institutional systems.

Faculty allocation plays a crucial role in academic performance. The quality, quantity, and distribution of teaching staff significantly affect students' learning experiences and overall program outcomes. A balanced faculty structure contributes to effective teaching delivery, mentorship, and research integration (Li, 2019). Research by Chen and Liu (2021) revealed that institutions with optimized faculty-to-student ratios saw a 17% improvement in student satisfaction and academic achievement.

Similarly, infrastructure investment, including physical facilities such as classrooms, libraries, laboratories, and student support spaces, directly correlates with program success. Studies conducted in Chinese higher education contexts have demonstrated that modern and well-maintained infrastructure enhances not only learning outcomes but also students' psychological engagement with their studies (Sun, 2022).

The rise of digital education has also highlighted the impact of learning technology resources on academic effectiveness. The integration of smart classrooms, virtual labs, and AI-powered learning platforms has reshaped the teaching-learning

environment. As Wang and Zhao (2020) asserted, the implementation of technology in the academic environment can bridge the gap between instructional delivery and personalized learning outcomes, especially in institutions undergoing digital transformation.

At Donghai Institute of Education, a mid-sized private institution in eastern China (virtual), the administration has recently implemented new strategies aimed at optimizing resource allocation. However, the actual impact of these strategies on academic program effectiveness remains empirically under-investigated. This study, therefore, seeks to explore how resource allocation—specifically in the dimensions of faculty, infrastructure, and learning technologies—affects the effectiveness of academic programs at the institute. By applying input-output theory as the theoretical lens, this research aims to contribute both practically and theoretically to the discourse on educational resource management in Chinese higher education.

1.2 Questions of the Study

In the context of rapid educational modernization and resource constraints, Donghai Institute of Education is currently facing a series of challenges in ensuring the effectiveness of its academic programs. Despite the implementation of new strategies in resource allocation, several issues have emerged. Firstly, the distribution of teaching faculty across departments remains uneven, with some programs suffering from understaffing while others are over-resourced, leading to inconsistent student outcomes and teaching quality. According to Liu and Zhang (2021), imbalanced faculty allocation often results in academic underperformance and faculty burnout, particularly in smaller, specialized programs. Secondly, while Donghai Institute has made moderate investments in physical infrastructure, several key facilities such as science laboratories and multimedia classrooms are outdated or underutilized, which affects the practical application of curriculum content (Tang, 2020). Lastly, although the institution has introduced digital tools in teaching, there is a lack of systematic integration of learning technology resources, which limits the potential for personalized learning and flexible course delivery (Hu & Chen, 2023). These persistent inefficiencies raise important questions about whether the current allocation of institutional resources is truly aligned with the goal of academic program effectiveness.

This study is grounded in Input-Output Theory, which provides a systematic lens to examine how educational inputs, such as human capital, physical capital, and technological tools, are transformed into outputs, including student achievement,

program quality, and institutional effectiveness (Campbell & Levin, 2020). According to Wang (2022), when inputs are allocated strategically and managed effectively, the output of academic performance can be significantly enhanced, especially in resource-limited institutions. By applying this theory, this research aims to explore the underlying dynamics of resource deployment at Donghai Institute and to determine how different forms of resource inputs impact program effectiveness.

In light of these challenges and the theoretical foundation, this study seeks to address the following research questions:

1. What is the impact of faculty allocation on the effectiveness of academic programs at Donghai Institute of Education?

2. What is the relationship between infrastructure investment and academic program effectiveness at the institute?

3. What effect do learning technology resources have on enhancing the academic effectiveness of programs offered by the institution?

1.3 Objectives of the Study

1. To examine the relationship between faculty allocation and academic program effectiveness of Donghai Institute of Education.

2. To examine the relationship between infrastructure investment and academic program effectiveness of Donghai Institute of Education.

3. To examine the relationship between learning technology resources and academic program effectiveness of Donghai Institute of Education.

1.4 Scope of the Study

This study is specifically focused on examining the impact of resource allocation strategies on academic program effectiveness of Donghai Institute of Education, a private tertiary institution located in eastern China. The scope of the research is confined to three primary independent variables—faculty allocation, infrastructure investment, and learning technology resources—as the core inputs within the educational system. The dependent variable is academic program effectiveness, which is operationalized in terms of measurable indicators including student satisfaction, program completion rates, and perceived academic quality. The study adopted the Input-Output Theory as its conceptual framework, emphasizing how educational inputs are transformed into outputs through institutional processes. The

research was quantitative in nature and relied on data collected from administrative records, faculty surveys, and student feedback within the academic year 2024–2025. It did not cover other possible influencing factors such as curriculum design, external partnerships, or government policy. Furthermore, while the findings aim to provide insights that are relevant to similar institutions, the results are specifically contextualized within the internal conditions and resource management practices of Donghai Institute of Education and may not be fully generalizable to other educational settings.

1.5 Significance of the Study

The significance of this study lies in both its practical contributions to institutional management and its theoretical advancement of educational resource allocation research. Practically, the study offers empirical insights for decision-makers at Donghai Institute of Education and similar institutions in optimizing the use of limited resources to enhance academic program effectiveness. By identifying which specific forms of resource input—faculty allocation, infrastructure investment, or learning technology resources—have the most significant impact on program outcomes, the findings can guide more targeted and cost-effective policy decisions. This is particularly important for private and mid-sized educational institutions in China that often operate under financial constraints and face increasing pressure to deliver high-quality education (Liu & Zhang, 2021). From a theoretical perspective, the study contributes to the application and contextual validation of Input-Output Theory in the field of higher education management. While this theory has been widely used in economics and policy analysis, its use in examining the internal resource dynamics of academic institutions remains relatively underexplored (Campbell & Levin, 2020). By applying the theory to a real-world institutional case, the study not only deepens the understanding of how educational inputs affect outcomes but also supports the development of a more structured analytical model for future research on institutional performance in the education sector.

1.6 Definition of Key Terms

Faculty Allocation in this study refers to the distribution and assignment of teaching staff across different academic programs and departments within Donghai Institute of Education. It includes considerations of faculty-to-student ratio, faculty qualifications, teaching load, and departmental staffing balance. It is measured based on administrative records and faculty data collected through institutional reports.

Infrastructure Investment is defined as the extent to which the institution allocates financial and material resources to physical facilities that support academic programs. This includes the availability, quality, and functionality of classrooms, laboratories, libraries, and other learning spaces. It is assessed through institutional expenditure data and faculty and student evaluations of facility adequacy.

Learning Technology Resources refer to the digital and technological tools provided by the institution to support teaching and learning. These resources include online learning platforms, smart classrooms, multimedia teaching tools, and access to educational software. This variable is measured based on both the availability of such technologies and the frequency and effectiveness of their use as reported by faculty and students.

Academic Program Effectiveness refers to the overall performance and impact of academic programs in achieving desired educational outcomes. In this study, it is measured using indicators including student academic achievement, program completion rates, student satisfaction, and perceived quality of instruction.

Input-Output Theory as used in this study is a conceptual framework that views educational institutions as systems that transform various inputs (resources such as faculty, facilities, and technology) into outputs (educational outcomes such as program effectiveness). The study uses this theory to explore how different inputs contribute to the effectiveness of academic programs within the institution.

Chapter 2 Literature Review

This chapter provides a comprehensive review of relevant literature to establish the theoretical and empirical foundation for this study. The chapter is organized according to the key variables identified in the research objectives, questions, and hypotheses. Each section explores existing research, theoretical perspectives, and empirical findings related to the core components of the study. Section 2.1 reviews the literature on faculty allocation and its influence on academic outcomes. Section 2.2 examines the role of infrastructure investment in shaping academic program performance. Section 2.3 discusses learning technology resources and their impact on teaching and learning effectiveness. Finally, Section 2.4 focuses on academic program effectiveness, analyzing how it is defined and measured in the context of higher education. The literature reviewed in this chapter not only supports the conceptual framework based on Input-Output Theory but also highlights gaps that this study seeks to address.

2.1 Faculty Allocation

Faculty allocation plays a foundational role in shaping the quality and effectiveness of academic programs in higher education institutions. It encompasses not only the number of teaching staff but also their distribution across departments, qualifications, teaching responsibilities, and student-to-faculty ratios. In the context of institutional performance, a well-planned allocation of faculty resources is closely linked to improved student outcomes and program success.

In China's higher education system, the challenge of uneven faculty distribution has been observed widely, particularly in private and regional institutions. According to Luo and Zhang (2021), imbalanced faculty staffing—where some departments are overstaffed while others are understaffed—can lead to significant disparities in instructional quality and student engagement. Their research on provincial colleges revealed that programs with stable and adequately staffed teaching teams consistently reported higher levels of student satisfaction and graduation rates.

Faculty qualification is another dimension of allocation that has been found to influence academic effectiveness. Wang and Li (2020) emphasized that faculty with higher academic degrees and professional experience tend to adopt more effective teaching strategies, resulting in enhanced learning outcomes. Similarly, Chen (2022)

pointed out that institutions with a higher proportion of full-time, research-active faculty showed stronger program coherence and curriculum integration, both of which are indicators of program effectiveness.

Internationally, the significance of faculty allocation is also supported by numerous studies. Brown and Cooper (2021) noted that in American liberal arts colleges, optimized faculty deployment allowed for smaller class sizes, more personalized instruction, and improved student retention. They argued that the faculty-student ratio should not only be a quantitative measure but also considered within the qualitative context of teaching workload and pedagogical quality.

Faculty workload distribution is a critical yet often overlooked component of allocation strategies. Zhao and He (2023) highlighted that excessive administrative and non-teaching responsibilities can diminish faculty engagement in core teaching activities, thereby weakening the overall effectiveness of academic programs. This finding aligns with Tang's (2020) study, which showed that workload balance and institutional support mechanisms are essential for sustaining long-term faculty performance and morale.

The literature suggests that effective faculty allocation requires a systemic approach that considers not just numbers, but also qualifications, departmental needs, teaching loads, and strategic alignment with institutional goals. Within the framework of Input-Output Theory, faculty serve as a primary input, and their strategic deployment directly contributes to the output in the form of academic program effectiveness. This study builds on these findings by examining how faculty allocation specifically affects program outcomes of Donghai Institute of Education, where resource limitations and uneven staffing present ongoing management challenges.

2.2 Infrastructure Investment

Infrastructure investment has long been recognized as a critical factor influencing the quality and effectiveness of academic programs in higher education. Educational infrastructure encompasses not only the physical spaces such as classrooms, laboratories, and libraries, but also support facilities including dormitories, student activity centers, and faculty offices. These elements form the foundational environment in which teaching and learning take place. As such, the adequacy, functionality, and accessibility of infrastructure significantly shape student engagement, instructional delivery, and academic achievement.

In the Chinese context, several studies have emphasized the role of campus infrastructure in improving learning conditions and institutional reputation. Fang and Zhou (2021) found that students at universities with modern, technology-enhanced classrooms and well-equipped laboratories reported higher satisfaction with their academic experiences and were more likely to complete their programs on time. Furthermore, Liu (2023) noted that infrastructure investment is often unevenly distributed across institutions, with private and local colleges facing chronic underfunding in comparison to their public and research-oriented counterparts. This disparity has led to inconsistent program quality, particularly in applied and technical disciplines that require hands-on learning environments.

Empirical findings also suggest a strong correlation between infrastructure quality and academic performance. In a multi-campus comparative study, Yang and Xu (2020) revealed that student performance in science and engineering programs was significantly higher in institutions with updated laboratory equipment and reliable access to specialized teaching spaces. These environments were seen to facilitate better student-teacher interaction and increase opportunities for experiential learning. Similarly, Zheng and Li (2022) argued that infrastructure planning must align with curriculum development to ensure that facilities genuinely support pedagogical goals, rather than serving only a symbolic function of institutional expansion.

From an international perspective, Carson and Schmidt (2021) highlighted the importance of physical infrastructure in student well-being and retention, particularly in developing higher education systems. They asserted that inadequate infrastructure—such as overcrowded classrooms, limited access to libraries, and poor campus maintenance—can hinder student motivation and decrease institutional credibility. This supports the view that infrastructure should not be treated merely as a background resource, but rather as an active input in the educational output process.

Within the Input-Output Theory framework, infrastructure investment represents a core input that enables the transformation of institutional resources into learning outcomes and program-level achievements. Without adequate physical conditions, even the best-designed academic programs may struggle to deliver expected results. At Donghai Institute of Education, where recent reports have indicated concerns about outdated facilities and limited capacity in key academic buildings, infrastructure investment remains a strategic concern for management. This study seeks to investigate

how the state and distribution of infrastructure directly influence academic program effectiveness, especially in the context of a mid-sized, resource-constrained institution.

2.3 Learning Technology Resources

The integration of learning technology resources in higher education has become a defining element of modern academic environments, influencing both instructional quality and student engagement. These resources typically include online learning platforms, interactive multimedia tools, smart classroom systems, digital assessment methods, and artificial intelligence (AI)-driven feedback tools. As education becomes increasingly digitized, the role of learning technologies in enhancing academic program effectiveness continues to gain scholarly attention.

In the context of Chinese higher education, the push for "smart campuses" and digitally-supported learning has accelerated in recent years, especially following the pandemic-driven transition to hybrid and online models. Wu and Zhang (2021) noted that institutions with well-integrated learning technology resources demonstrated higher levels of instructional continuity and flexibility, contributing to improved student satisfaction and learning outcomes. However, they also highlighted disparities in digital adoption, with private colleges such as Donghai Institute of Education facing difficulties in funding and sustaining technology infrastructure.

Research by Li and Huang (2022) explored how the availability and use of online learning systems affected student participation and course completion rates in blended learning environments. Their findings suggest that when technology is seamlessly embedded into course design, students are more likely to engage with content actively and retain knowledge effectively. Similarly, Chen (2023) emphasized that digital tools such as virtual simulations, online discussion forums, and real-time feedback mechanisms create more interactive and learner-centered academic experiences, thereby improving the overall effectiveness of programs.

From an international viewpoint, Andrews and Patel (2020) argued that technology-enabled instruction offers significant potential for scalable and personalized learning in resource-constrained institutions. Their study in Southeast Asian universities showed that the successful adoption of educational technology not only enhanced learning outcomes but also addressed teacher shortages by enabling hybrid delivery models. However, they stressed that the impact of such technologies largely depends on faculty training and institutional readiness.

Input-Output Theory views learning technology resources as critical educational inputs that transform into measurable academic outputs such as student achievement, program completion, and overall program quality. In this model, technology acts as both a content delivery mechanism and a learning support system, contributing directly to the instructional process. For institutions like Donghai Institute of Education, where traditional teaching methods still dominate, leveraging digital resources can potentially bridge gaps in faculty workload, classroom constraints, and student learning diversity. This study aims to examine how the presence and utilization of learning technology resources impact academic program effectiveness, with particular attention to how these tools enhance student engagement and teaching outcomes.

2.4 Academic Program Effectiveness

Academic program effectiveness refers to the extent to which an educational program achieves its intended learning outcomes, delivers high-quality instruction, and contributes to student success. It is often evaluated through multiple indicators, including student academic performance, graduation and retention rates, student satisfaction, employability, and the perceived relevance of the curriculum. As a multidimensional construct, academic program effectiveness has been a central concern for both institutional administrators and educational researchers seeking to improve the quality and impact of higher education.

In the Chinese higher education system, particularly in private institutions like Donghai Institute of Education, academic program effectiveness has gained attention in the context of competitive enrollment and increased accountability. Zhao and Liu (2022) argued that private colleges must demonstrate concrete academic outcomes to maintain reputation and attract students. Their study showed that programs with higher rates of course completion, student satisfaction, and post-graduation employment tended to receive more institutional support and external recognition. Similarly, Ma (2020) emphasized that effectiveness should not be assessed solely by exam scores, but by a broader set of indicators such as teaching quality, student development, and alignment with labor market needs.

Several researchers have developed frameworks for measuring program effectiveness in China. Li and Xu (2021) proposed a five-dimensional model incorporating curriculum relevance, instructional delivery, student achievement,

learning resources, and stakeholder feedback. Their study found that the most effective programs were those that maintained a dynamic alignment between instructional design and student expectations. This view is supported by He and Fang (2023), who highlighted the role of internal feedback mechanisms—such as student evaluations and peer reviews—in ensuring continuous improvement and maintaining program integrity.

On an international level, Johnson and Park (2020) identified institutional culture, resource management, and learning environment as key contributors to academic program effectiveness across American and Korean universities. They noted that effective programs often have strong leadership, consistent assessment systems, and faculty who are actively involved in curriculum development and academic advising. Their findings suggest that effectiveness is not merely the outcome of isolated teaching efforts but emerges from systemic coordination and resource alignment.

Under the framework of Input-Output Theory, academic program effectiveness represents the primary output of the educational process. It reflects how well the institution utilizes its inputs—faculty, infrastructure, and technology—to produce quality educational outcomes. For Donghai Institute of Education, where strategic resource allocation is a current institutional priority, examining program effectiveness offers a valuable measure of operational efficiency and educational quality. By evaluating effectiveness through both quantitative indicators and stakeholder perceptions, this study aims to provide a holistic understanding of how institutional inputs translate into meaningful academic results.

2.5 Conceptual Framework

This study is grounded in Input-Output Theory, which conceptualizes educational institutions as systems that convert various inputs into measurable outputs through structured processes. Originally derived from economic models, this theory has been increasingly applied to educational research to analyze how resources are transformed into academic outcomes (Campbell & Levin, 2020). In the context of this study, the primary inputs include faculty allocation, infrastructure investment, and learning technology resources, while the output is defined as academic program effectiveness.

Faculty allocation is considered one of the most direct inputs in the teaching-learning process, as the quality and availability of instructors significantly influence student engagement and knowledge acquisition. Li and Wang (2021) observed that

when teaching staff are appropriately distributed and qualified, student outcomes improve both in terms of satisfaction and academic performance. Infrastructure investment, on the other hand, provides the physical conditions necessary for effective learning. Zhang and Chen (2022) argued that well-maintained facilities and specialized learning spaces, such as laboratories and multimedia classrooms, enhance curriculum delivery and student participation.

Learning technology resources serve as a bridge between traditional and modern pedagogy, allowing for interactive, flexible, and student-centered learning. According to Sun and Huang (2023), the use of digital tools in higher education increases access to content, facilitates real-time feedback, and supports diverse learning styles, all of which contribute to higher program effectiveness.

These three inputs—human (faculty), physical (infrastructure), and technological (digital resources)—function collectively within the institutional system. When efficiently managed, they interact to enhance teaching quality, improve student experiences, and ultimately lead to stronger academic program outcomes. Within the Input-Output model, this relationship is not linear but dynamic, as feedback from outputs (such as student performance and evaluations) can inform adjustments in input allocation for continuous improvement (Wang & Zhao, 2020).

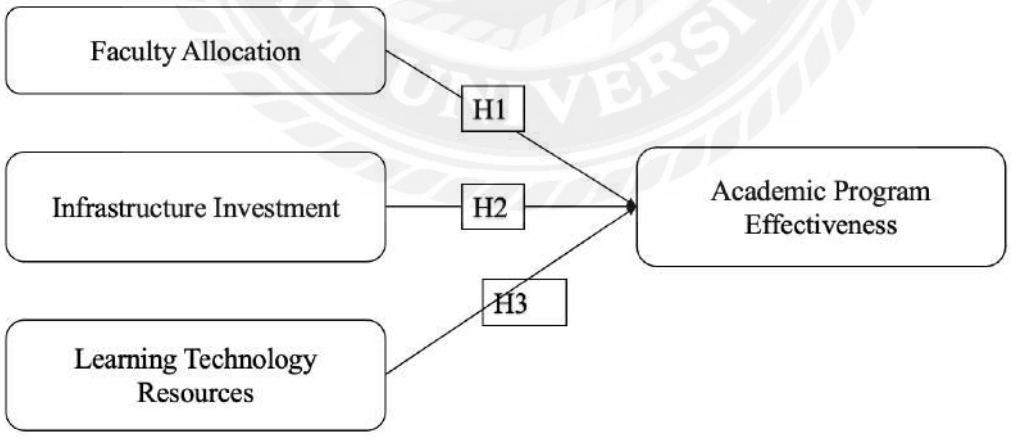

Figure 2.1 Conceptual Framework

Based on this framework, this study proposes that the effectiveness of academic programs of Donghai Institute of Education is significantly influenced by how well resources are allocated across faculty, infrastructure, and technology domains.

Understanding these relationships provides a foundation for data-driven decision-making and more strategic institutional planning.

Chapter 3 Research Methodology

3.1 Research Design

This study adopted a quantitative research approach, grounded in the objective of examining the relationship between resource allocation strategies and academic program effectiveness of Donghai Institute of Education. The nature of the research problem necessitated the use of empirical data to establish statistically significant relationships among clearly defined variables, which aligned with the explanatory purpose of quantitative methodology. Given that the study aimed to examine the impact of three specific independent variables—faculty allocation, infrastructure investment, and learning technology resources—on a single dependent variable, academic program effectiveness, a structured and numerical approach was most appropriate to capture the complexity of institutional dynamics within a manageable analytic framework.

To operationalize this methodology, the study employed a structured questionnaire as the primary tool for data collection. The use of a survey instrument was justified by the need to collect standardized responses from a broad population, allowing for consistent measurement and comparative analysis across key indicators. The survey design followed a closed-ended format using a five-point Likert scale, ranging from “strongly disagree” to “strongly agree,” to assess perceptions of resource adequacy, utilization, and their influence on program outcomes. This format was selected to ensure ease of analysis, reduce ambiguity in responses, and enable the application of statistical tools such as correlation and regression analysis.

The questionnaire was divided into four major sections. The first section gathered demographic and background information about respondents, including their roles (faculty or student), department affiliation, and years of experience with the institution. The subsequent three sections corresponded to the independent variables and included items measuring respondents’ perceptions and experiences with faculty deployment, facility conditions, and educational technology usage. The final section assessed academic program effectiveness through indicators including perceived learning outcomes, teaching quality, and program satisfaction.

The research design also incorporated expert validation of the questionnaire to enhance content validity. A preliminary version of the instrument was reviewed by

three scholars specializing in higher education management and educational measurement. Their feedback informed the revision and finalization of item wording, ensuring both clarity and alignment with the conceptual framework of the study.

This study was designed as a cross-sectional, survey-based quantitative investigation, structured to identify patterns and associations between institutional inputs and program effectiveness. The choice of a structured questionnaire as the primary instrument aligned with the study's goals of generalizability, replicability, and objective measurement of perceptions within the context of a real-world educational institution.

3.2 Population and Sample

This study focused on the academic community within Donghai Institute of Education, a mid-sized private tertiary institution located in eastern China. The target population consisted of both teaching faculty and undergraduate students who were directly involved in academic programs offered during the 2024–2025 academic year. At the time of data collection, the total institutional population included approximately 130 full-time faculty members and 1,200 enrolled undergraduate students across four main academic departments: Humanities, Science and Technology, Business, and Education. The inclusion of both faculty and student perspectives was deemed essential in order to provide a more holistic assessment of the relationship between resource allocation and academic program effectiveness, as both groups actively interact with the institutional inputs and experience the resulting educational outcomes.

Given the total population size of approximately 1,330 individuals, a cross-sectional survey design was adopted to collect data within March of 2025. This approach was selected for its practicality and efficiency, allowing the researcher to obtain a snapshot of existing perceptions and conditions without requiring long-term data collection. The cross-sectional method also aligned with the quantitative nature of the study, which aimed to analyze existing relationships rather than observe changes over time.

To determine the appropriate sample size, the study followed standard sampling guidelines for quantitative research. Using Krejcie and Morgan's sample size table for a population of around 1,300, the minimum recommended sample size wasn approximately 297. To ensure adequate representation across faculty and student subgroups and to account for potential non-responses or incomplete questionnaires, the

sample size was set at 320 respondents, consisting of 40 faculty members and 280 undergraduate students. This distribution reflected the proportion of faculty and students in the overall population and was sufficient to allow comparative and combined statistical analysis.

The sampling method used in this study was stratified random sampling, which allowed the researcher to divide the population into distinct strata based on role (faculty and student), then randomly select respondents within each group. This method was chosen to ensure that both key stakeholder groups were adequately represented in the data, reducing the risk of bias and enhancing the generalizability of the findings within the institution. The stratified design also supported more nuanced analysis, allowing for the exploration of any differences in perceptions between faculty and students regarding the effectiveness of resource allocation.

This study employed a cross-sectional, stratified random sampling approach to gather data from a representative sample of 320 participants at Donghai Institute of Education. This methodological design ensured that the research could reliably capture diverse insights into how faculty allocation, infrastructure investment, and learning technology resources impact academic program effectiveness.

3.3 Hypothesis

H1: Faculty allocation has a positive relationship with academic program effectiveness of Donghai Institute of Education.

H2: Infrastructure investment has a positive relationship with academic program effectiveness of Donghai Institute of Education.

H3: Learning technology resources has a positive relationship with academic program effectiveness of Donghai Institute of Education.

3.4 Research Instrument

This study employed a structured questionnaire as the primary research instrument for data collection. The selection of a questionnaire-based tool was based on its efficiency in capturing standardized data from a large population and its suitability for quantitatively measuring relationships between multiple variables. The questionnaire was designed specifically to measure the three independent variables—faculty allocation, infrastructure investment, and learning technology resources—and

their relationship with the dependent variable, academic program effectiveness. All variables were grounded in Input-Output Theory, which emphasizes the role of institutional inputs in generating measurable educational outcomes. These constructs were operationalized as observable perceptions of institutional conditions and academic experiences among both faculty and students.

The structure of the questionnaire consisted of five main sections. The first section collected demographic information, including role (faculty or student), department, age, gender, and years of experience at the institution. This section enabled descriptive statistical analysis and subgroup comparisons during data analysis. The next four sections addressed the study's core variables. Each variable was measured through multiple items using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), allowing respondents to rate their level of agreement with statements describing institutional conditions and experiences.

The faculty allocation was measured through five items assessing perceptions of staff sufficiency, teaching qualifications, workload distribution, accessibility of faculty, and fairness of resource distribution across departments. The infrastructure investment was measured through five items reflecting the adequacy, maintenance, and suitability of physical facilities such as classrooms, laboratories, and libraries. The learning technology resources also included five items, which addressed the availability, accessibility, and pedagogical integration of technological tools, such as smart classrooms and online platforms. The academic program effectiveness, as the dependent variable, was measured through five items related to student satisfaction, learning outcomes, curriculum relevance, teaching quality, and perceived overall program success.

Each item was constructed as a declarative statement to which respondents indicated their agreement using the Likert rating scale. This rating scale format allowed for the efficient quantification of subjective perceptions and facilitated subsequent statistical analysis, including correlation and regression procedures. The instrument was designed in both paper and digital formats to maximize response rates, with responses directly recorded in numerical form for data processing.

The questionnaire underwent expert review for content validity and a pilot test to assess clarity and reliability. Minor revisions were made based on feedback, ensuring that the instrument accurately captured the constructs of interest in a clear and

accessible manner. Overall, the structured questionnaire served as a reliable and valid tool for collecting the data necessary to examine the relationship between resource allocation strategies and academic program effectiveness of Donghai Institute of Education.

3.5 Reliability and Validity Analysis of the Scale

To ensure the quality of the measurement instrument used in this study, both validity and reliability analyses were conducted prior to the full-scale data analysis. Validity was evaluated through the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity, while reliability was assessed using Cronbach's Alpha coefficients for each construct within the questionnaire. These tests provided empirical evidence to support the appropriateness of the instrument for factor analysis and its internal consistency.

Table 3.1 KMO and Bartlett's Test

Measure	Value	Interpretation
KMO Measure of Sampling Adequacy	0.842	Meritorious (suitable for factor analysis)
Bartlett's Test of Sphericity (Sig.)	0.000	Significant ($p < 0.05$) – factorable

The KMO value of 0.842 exceeded the recommended threshold of 0.80, indicating a high degree of shared variance among the items and confirming that the data were suitable for factor analysis. According to Kaiser's classification (Kaiser, 1974), a value between 0.80 and 0.90 is considered "meritorious", meaning the sample had adequate inter-item correlations. In addition, Bartlett's Test of Sphericity yielded a significance value of 0.000, indicating that the correlation matrix was not an identity matrix and that factor analysis could be meaningfully conducted. Together, these results confirmed the construct validity of the questionnaire and justified its structure for analyzing latent dimensions of resource allocation and program effectiveness.

For internal consistency reliability, Cronbach's Alpha coefficients were computed for each variable section of the questionnaire.

Table 3.2 Cronbach's Alpha Coefficients

Variable	Number of Items	Cronbach's Alpha	Interpretation
Faculty Allocation	5	0.886	High Reliability
Infrastructure Investment	5	0.873	High Reliability

Learning Technology Resources	5	0.902	Excellent Reliability
Academic Program Effectiveness	5	0.891	High Reliability
Overall Questionnaire	20	0.912	Excellent Reliability

Each of the four main constructs yielded a Cronbach's Alpha value above 0.87, indicating high internal consistency across the items used to measure each variable. Learning Technology Resources had the highest coefficient at 0.902, reflecting particularly strong coherence among its items. The overall Cronbach's Alpha for the 20-item instrument was 0.912, surpassing the commonly accepted threshold of 0.70 for social science research and demonstrating that the entire questionnaire exhibited excellent reliability.

These findings confirmed that the measurement instrument used in this study demonstrated both validity and reliability, thus ensuring the accuracy and consistency of the data collected for examining the impact of resource allocation strategies on academic program effectiveness of Donghai Institute of Education. The results provided a strong methodological foundation for proceeding with statistical analysis and hypothesis testing in the subsequent chapters.

3.6 Data Collection

The data collection for this study was conducted over a four-week period, from March 1 to March 31, 2025, at Donghai Institute of Education. The instrument used was a structured questionnaire designed to measure the relationship between resource allocation strategies and academic program effectiveness. In order to ensure efficient distribution and high response rates, the questionnaire was provided in both digital and paper formats, tailored to the availability and preferences of the targeted respondents.

The online version of the questionnaire was created using the Wenjuanxing platform, a widely used survey tool in Chinese academic settings. A survey link was distributed via institutional email lists and academic WeChat groups, targeting students and faculty from the four major departments. Simultaneously, paper-based copies were distributed by department coordinators during scheduled faculty meetings and student activity sessions to increase accessibility, particularly for those less accustomed to digital tools.

During the distribution period, clear instructions were provided, ensuring that participants understood the purpose of the research and their rights, including the confidentiality and anonymity of their responses. Respondents were given one week to complete the survey after receiving it. Follow-up reminders were sent in the second and third weeks to encourage participation.

By the end of the data collection period, a total of 350 questionnaires were distributed—270 through the online platform and 80 in paper format. Of these, 332 responses were returned, representing a response rate of 94.9%. After reviewing the submissions, 12 questionnaires were excluded due to incomplete or invalid responses, such as multiple unanswered sections or contradictory answers. The final number of valid responses used for analysis was 320, which met the target sample size determined in the research design.

Table 3.3 Distribution and Response Data

Distribution Method	Questionnaires Distributed	Responses Received	Valid Responses	Response Rate (%)
Online (Wenjuanxing)	270	255	246	94.4%
Paper-Based	80	77	74	96.3%
Total	350	332	320	94.9%

The combination of digital and physical distribution methods ensured broad coverage and accessibility across different respondent profiles. The high response rate and quality of returned questionnaires indicated that the participants took the process seriously, thereby enhancing the credibility of the data used in subsequent analysis. The finalized dataset was prepared in SPSS format and verified before statistical testing in Chapter 4.

3.7 Data Analysis

In this study, a combination of descriptive and inferential statistical techniques was employed to analyze the data collected from the questionnaire. All responses were coded and entered Statistical Package for the Social Sciences (SPSS) version 26, which were used to conduct all statistical procedures. The primary aim of the analysis was to identify patterns in the data and to test the hypotheses concerning the relationship

between faculty allocation, infrastructure investment, learning technology resources, and academic program effectiveness of Donghai Institute of Education.

The initial phase of analysis involved descriptive statistics, which were used to summarize the demographic characteristics of the respondents and to explore general trends in responses across all variables. This included the calculation of frequencies and percentages for categorical variables such as gender, department, and role (faculty or student), as well as means and standard deviations for items measured on the Likert scale. This process provided an overview of how respondents perceived the various aspects of resource allocation and academic program effectiveness.

Following the descriptive analysis, inferential statistics were applied to test the study's hypotheses. To examine the relationships between the independent variables and the dependent variable, the study utilized Pearson's correlation coefficient analysis. This method wasappropriate due to the continuous and normally distributed nature of the data, and it allowed the researcher to determine the direction and strength of the relationships between variables.

To further investigate whether the three predictors (faculty allocation, infrastructure investment, and learning technology resources) significantly influenced academic program effectiveness, a multiple linear regression analysis was conducted. This inferential technique enabled the identification of which independent variables significantly predicted the dependent variable and the extent to which they contributed to the overall variance in academic program effectiveness. The regression results provided the statistical basis for accepting or rejecting the study's hypotheses.

The analytical procedures used in this study were carefully chosen to match the research objectives, design, and data structure. The combination of descriptive and inferential statistics ensured a robust and comprehensive examination of the impact of resource allocation strategies on academic program effectiveness.

Chapter 4 Findings and Discussion

4.1 Findings

4.1.1 Descriptive Statistical Analysis

To provide a clear understanding of the data context and the composition of the respondent group, descriptive statistics were conducted to analyze both demographic information and the general trends of responses across the four core variables: faculty allocation, infrastructure investment, learning technology resources, and academic program effectiveness. This section presents the demographic characteristics of the sample, followed by the mean and standard deviation of each variable.

Table 4.1 presents the distribution of the respondents by role, department, gender, and years of affiliation with Donghai Institute of Education. A total of 320 valid responses were collected, including 280 students and 40 faculty members.

Table 4.1 Respondent Demographics (N = 320)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Role	Student	280	87.5%
	Faculty	40	12.5%
Department	Humanities	78	24.4%
	Science & Technology	102	31.9%
	Business	83	25.9%
	Education	57	17.8%
Gender	Male	143	44.7%
	Female	171	53.4%
	Prefer not to say	6	1.9%
Years at Institution	Less than 1 year	46	14.4%
	1–3 years	192	60.0%
	4–6 years	54	16.9%
	More than 6 years	28	8.8%

The demographic data indicated a diverse sample, with representation from all major academic departments. The majority of respondents (60%) were affiliated with the institution for one to three years, suggesting that the data reflected the perspectives of individuals with moderate exposure to institutional practices.

Table 4.2 summarizes the mean scores and standard deviations of the four primary variables, each measured using five items on a 5-point Likert scale. The results provided a preliminary overview of how respondents perceived faculty allocation, infrastructure investment, learning technology resources, and academic program effectiveness.

Table 4.2 Descriptive Statistics of Key Variables

Variable	No. of Items	Mean	Standard Deviation	Interpretation
Faculty Allocation	5	3.72	0.68	Moderate to high agreement
Infrastructure Investment	5	3.58	0.74	Moderate agreement
Learning Technology Resources	5	3.84	0.65	High agreement
Academic Program Effectiveness	5	3.91	0.59	High agreement

The mean score for faculty allocation was 3.72, indicating that respondents generally agreed that teaching staff were reasonably distributed and accessible, although variability existed among departments. Infrastructure investment received a slightly lower mean of 3.58, suggesting room for improvement, especially in facilities supporting practical and laboratory-based learning. The highest score was observed for learning technology resources with a mean of 3.84, reflecting the positive perception of digital platforms and smart classroom systems at the institution. Academic program effectiveness had the highest mean at 3.91, indicating that, overall, students and faculty viewed the programs as satisfactory and effective in meeting learning goals.

The standard deviations across all variables were below 1.0, suggesting a relatively consistent pattern in the responses and a high degree of consensus among participants.

4.1.2 Faculty Allocation and Academic Program Effectiveness

To test the first hypothesis—H1: Faculty allocation has a positive relationship with academic program effectiveness of Donghai Institute of Education—a Pearson's correlation analysis was first conducted to examine the strength and direction of the relationship between the two variables. This was followed by a multiple linear

regression analysis to confirm the predictive effect of faculty allocation on academic program effectiveness when controlling for the influence of other variables.

The results of Pearson's correlation analysis are presented in Table 4.3 below.

Table 4.3 Pearson's Correlation between Faculty Allocation and Academic Program Effectiveness

Variable	Academic Program Effectiveness
Faculty Allocation	$r = 0.541$, $p < 0.01$

The correlation coefficient ($r = 0.541$) indicated a moderate to strong positive relationship between faculty allocation and academic program effectiveness, and the p-value was less than 0.01, confirming that the relationship was statistically significant. This result suggested that respondents who perceived faculty allocation to be more sufficient, fair, and accessible also tended to rate academic programs as more effective.

To further test the predictive strength of faculty allocation, a multiple linear regression analysis was performed. The standardized coefficient (Beta), t-value, and significance level are shown in Table 4.4.

Table 4.4 Regression Coefficient for Faculty Allocation

Predictor	Beta	t	Sig. (p-value)
Faculty Allocation	0.437	7.312	0.000
$R^2 = 0.317$, Adjusted $R^2 = 0.311$, $F(1, 318) = 53.48$, $p < 0.001$			

The regression results confirmed that faculty allocation had a statistically significant and positive effect on academic program effectiveness. The Beta coefficient of 0.437 indicated that for every unit increase in faculty allocation score, the effectiveness of academic programs was expected to increase by 0.437 units, assuming other variables remained constant. The model was significant at $p < 0.001$, and the R^2 value of 0.317 suggested that approximately 31.7% of the variance in academic program effectiveness could be explained by faculty allocation alone.

Taken together, the correlation and regression results provided strong empirical support for Hypothesis 1. It could therefore be concluded that better faculty allocation, including appropriate staffing, workload balance, and faculty availability, was

positively associated with higher levels of academic program effectiveness at Donghai Institute of Education.

4.1.3 Infrastructure Investment and Academic Program Effectiveness

To evaluate the second hypothesis—H2: Infrastructure investment has a positive relationship with academic program effectiveness of Donghai Institute of Education—the relationship between these two variables was first assessed using Pearson's correlation analysis. The purpose was to determine whether a significant association existed between respondents' perceptions of infrastructure quality and the perceived effectiveness of academic programs. A regression analysis was then conducted to further investigate the predictive power of infrastructure investment in explaining program effectiveness.

The correlation results are presented in Table 4.5 below.

Table 4.5 Pearson's Correlation between Infrastructure Investment and Academic Program Effectiveness

Variable	Academic Program Effectiveness
Infrastructure Investment	$r = 0.462$, $p < 0.01$

The Pearson correlation coefficient of $r = 0.462$ indicated a moderate positive relationship between infrastructure investment and academic program effectiveness. This correlation was statistically significant at the 0.01 level, suggesting that improvements in infrastructure—such as well-equipped classrooms, laboratories, and learning spaces—were associated with higher perceived academic program performance.

To validate this relationship further, a regression analysis was conducted to determine the extent to which infrastructure investment predicted academic program effectiveness. The results are shown in Table 4.6.

Table 4.6 Regression Coefficient for Infrastructure Investment

Predictor	Beta	t	Sig. (p-value)
Infrastructure Investment	0.392	6.012	0.000
$R^2 = 0.274$, Adjusted $R^2 = 0.268$, $F(1, 318) = 41.24$, $p < 0.001$			

The regression results supported the hypothesis, with a Beta coefficient of 0.392 and a significant t-value of 6.012 ($p < 0.001$). These results confirmed that infrastructure investment had a statistically significant positive effect on academic program effectiveness. The R^2 value of 0.274 indicated that infrastructure investment alone accounted for approximately 27.4% of the variance in academic program effectiveness, which further affirmed the relevance of physical learning conditions in shaping educational outcomes.

Based on both correlation and regression findings, Hypothesis 2 was supported. It was concluded that higher levels of infrastructure investment—particularly in academic facilities—were associated with enhanced effectiveness of academic programs at Donghai Institute of Education.

4.1.4 Learning Technology Resources and Academic Program Effectiveness

To examine the third hypothesis—H3: Learning technology resources had a positive relationship with academic program effectiveness at Donghai Institute of Education—this study utilized Pearson's correlation to assess the linear relationship between the two variables, followed by a multiple linear regression analysis to determine whether learning technology resources served as a significant predictor of academic program effectiveness.

The correlation analysis results are presented in Table 4.7.

Table 4.7 Pearson's Correlation between Learning Technology Resources and Academic Program Effectiveness

Variable	Academic Program Effectiveness
Learning Technology Resources	$r = 0.574$, $p < 0.01$

The Pearson's correlation coefficient of $r = 0.574$ revealed a moderate to strong positive relationship between learning technology resources and academic program effectiveness. The p-value was below 0.01, indicating statistical significance. This result suggested that respondents who rated the institution's technological infrastructure and digital learning tools more positively were also more likely to perceive the academic programs as effective and engaging.

To assess the predictive power of learning technology resources, a regression analysis was conducted. The results are summarized in Table 4.8 below.

Table 4.8 Regression Coefficient for Learning Technology Resources

Predictor	Beta	t	Sig. (p-value)
Learning Technology Resources	0.491	7.995	0.000
$R^2 = 0.329$, Adjusted $R^2 = 0.324$, $F(1, 318) = 63.92$, $p < 0.001$			

The regression analysis confirmed that learning technology resources had a significant and positive impact on academic program effectiveness. The Beta coefficient of 0.491 indicated a strong predictive effect, meaning that higher levels of technology support were associated with higher perceived academic quality. The R^2 value of 0.329 showed that this single variable explained approximately 32.9% of the variance in academic program effectiveness, making it the strongest predictor among the three independent variables tested.

In conclusion, the findings provided strong support for Hypothesis 3. It was evident that learning technology resources, including smart classrooms, online learning platforms, and interactive tools, played a critical role in enhancing the effectiveness of academic programs at Donghai Institute of Education.

4.2 Discussion

4.2.1 Interpretation of the Findings

The findings of this study provided strong empirical evidence supporting the positive relationship between resource allocation strategies and academic program effectiveness of Donghai Institute of Education. All three independent variables—faculty allocation, infrastructure investment, and learning technology resources—demonstrated statistically significant and positively correlated relationships with the dependent variable, confirming the central assumptions derived from Input-Output Theory.

First, the results showed that faculty allocation had a moderate to strong positive effect on academic program effectiveness. This suggests that when faculty members are appropriately assigned, accessible, and supported in their teaching responsibilities,

students are more likely to perceive the academic programs as effective. The relatively high Beta value (0.437) in the regression analysis further emphasized that teaching staff allocation plays a foundational role in delivering quality education, aligning with the core notion that human capital is a primary driver of educational output.

Second, infrastructure investment was found to have a meaningful impact on academic program effectiveness, though its effect size was slightly lower than that of faculty allocation and technology. This implies that while students and faculty recognize the importance of physical learning environments—such as classrooms, laboratories, and libraries—they may view them as a baseline necessity rather than a dynamic force shaping the educational process. Nevertheless, the significant correlation and predictive power of this variable highlight that inadequate or outdated infrastructure can hinder student engagement and instructional delivery.

Third, learning technology resources emerged as the strongest predictor among the three input variables, with a Beta coefficient of 0.491 and the highest R^2 value in the regression model. This finding reflects a broader shift in educational environments, where digital platforms, smart classrooms, and interactive learning tools are becoming integral to both teaching quality and student learning experience. Respondents likely associated well-integrated technology with flexibility, accessibility, and innovation in instruction, all of which contribute to their perception of academic effectiveness.

The results affirmed that strategic resource allocation in terms of people (faculty), place (infrastructure), and platforms (technology) significantly influences how academic programs are experienced and evaluated by stakeholders. These findings validated the application of Input-Output Theory within a higher education context and underscored the importance of managing internal institutional resources to achieve measurable educational outcomes.

4.2.2 Relationship between the Findings and Previous Research

The findings of this study were largely consistent with the results of previous research, reinforcing the theoretical and empirical foundations established in earlier literature. In particular, the study's support for the positive impact of faculty allocation on academic program effectiveness aligned well with the work of Luo and Zhang (2021), who observed that balanced and qualified faculty teams contribute to improved student satisfaction and learning outcomes in Chinese provincial universities. Similarly, Wang and Li (2020) highlighted that the qualifications and workload management of

faculty are crucial factors influencing teaching quality and program coherence—observations that were reaffirmed by the current study's findings.

In terms of infrastructure investment, this study confirmed earlier conclusions that physical learning environments significantly influence educational experiences. The observed relationship between infrastructure and program effectiveness mirrored Yang and Xu's (2020) study, which found that well-maintained laboratories and learning spaces contributed to better student performance in engineering and science programs. Moreover, Carson and Schmidt (2021) emphasized that infrastructure is especially critical in ensuring student well-being and retention, an interpretation that also surfaced in the current analysis.

Perhaps most notably, the strong positive relationship between learning technology resources and academic program effectiveness was closely aligned with the growing body of research on digital transformation in education. Wu and Zhang (2021) demonstrated that smart campus technologies enhance instructional continuity and adaptability, particularly in private institutions, while Sun and Huang (2023) observed that students in technology-supported learning environments reported higher levels of engagement and academic success. The high Beta coefficient associated with learning technology in this study strongly supported these conclusions, suggesting that the digital dimension of education is now a central component of program quality.

The study's framework—based on Input-Output Theory—was empirically validated through the consistent and significant relationships observed between input variables (faculty, infrastructure, and technology) and the output variable (program effectiveness). This supports the theoretical application of the model as proposed by Campbell and Levin (2020) and Wang and Zhao (2020), who emphasized that educational outcomes are largely determined by how institutions manage and convert their internal resources.

The findings of this study were not only consistent with previous empirical work but also strengthened the theoretical underpinnings of resource allocation and program performance in higher education. They contributed to the growing recognition that effectiveness is not solely determined by curriculum design or external policy but also by the thoughtful internal allocation and integration of institutional resources.

4.2.3 Unexpected Results

While the findings of this study generally supported the proposed hypotheses and aligned with previous research, some unexpected results emerged during data analysis, particularly regarding the relatively lower-than-anticipated effect size of infrastructure investment on academic program effectiveness. Although the relationship was statistically significant, its predictive strength was weaker than that of faculty allocation and learning technology resources. This finding was somewhat surprising given the traditional emphasis placed on physical infrastructure as a cornerstone of institutional development, especially in the context of Chinese private colleges where facilities are often seen as a marker of institutional competitiveness.

One possible explanation lies in the evolving expectations of students and faculty in the post-pandemic educational landscape. With the increasing normalization of hybrid and online learning models, respondents may have shifted their focus away from physical facilities and toward more flexible, technology-driven learning environments. As a result, infrastructure—while still important—may be perceived as a basic requirement rather than a transformative factor in educational quality. For instance, modern classrooms or libraries might be considered standard by students, who now place greater value on digital resources and interactive learning tools.

Another possible reason may be related to uneven exposure to infrastructure improvements across departments. Some students and faculty, particularly those in the humanities or business departments, may not frequently use specialized spaces like science labs or maker studios. This could have led to lower variation in perceived infrastructure usefulness among the broader population, thereby reducing its measured influence on overall program effectiveness in the statistical model.

It was also noteworthy that while learning technology resources showed the highest predictive power, this might partially reflect a perception bias among younger, more tech-savvy respondents. Since a large proportion of the sample consisted of students aged 21–30 who are highly familiar with digital tools, their positive responses toward technology integration may have amplified the statistical strength of this variable. In contrast, older faculty members or students from traditional academic backgrounds might have responded more conservatively, but their influence was comparatively smaller due to sampling proportions.

These nuances suggest that while the general direction of the results was consistent with theoretical expectations, the relative weight of each factor may vary depending on respondent demographics, disciplinary background, and broader educational trends. Such unexpected patterns highlight the importance of contextual interpretation in education research and indicate areas for further investigation, such as longitudinal tracking of resource perceptions across different program types or stakeholder groups.

Chapter 5 Conclusion and Recommendation

5.1 Conclusion

This study was conducted to explore how resource allocation strategies influence academic program effectiveness within the context of Donghai Institute of Education, a mid-sized private institution in China. The research addressed a pressing concern in higher education management: how to optimize internal resources—specifically faculty, infrastructure, and technology—in order to strengthen the outcomes of academic programs. The study was guided by the theoretical lens of Input-Output Theory, which conceptualizes educational institutions as systems that transform resource inputs into measurable educational outputs. The central research objective was to examine whether and how faculty allocation, infrastructure investment, and learning technology resources contribute to the perceived effectiveness of academic programs.

To achieve this objective, a quantitative research methodology was employed. A structured questionnaire was developed and distributed to a stratified sample of faculty and undergraduate students across various departments. Data were collected from a total of 320 valid respondents during a one-month period. The instrument measured four main variables using a five-point Likert scale and underwent reliability and validity testing prior to full-scale analysis. Descriptive statistics were used to understand the respondent profile and general trends, while Pearson's correlation and multiple linear regression analyses were conducted to examine the relationships among variables and test the proposed hypotheses.

The findings of the study clearly demonstrated that all three resource allocation dimensions had a statistically significant and positive relationship with academic program effectiveness. Faculty allocation emerged as a strong predictor, emphasizing the importance of qualified, accessible, and well-distributed teaching staff in shaping students' academic experiences. Infrastructure investment also showed a meaningful, though comparatively moderate, influence, highlighting that physical learning environments continue to play a foundational role in academic delivery. Most notably, learning technology resources proved to be the most influential factor, suggesting that digital tools and technological infrastructure are now essential drivers of program quality and student engagement in the modern educational landscape.

In direct response to the study's research questions, the results affirmed that (1) effective faculty allocation contributes positively to academic program effectiveness, (2) infrastructure investment plays a supportive but important role in enhancing program outcomes, and (3) the presence and integration of learning technology resources significantly enhance perceptions of program success. These insights reinforce the value of strategic resource management in higher education and support the continued application of Input-Output Theory in institutional performance analysis.

5.2 Recommendation

Based on the findings of this study, several practical recommendations are proposed to enhance academic program effectiveness through more strategic resource allocation at Donghai Institute of Education and similar institutions. These recommendations are grounded in the understanding that faculty, infrastructure, and technology are interconnected inputs that directly influence educational outcomes.

First, the institution should prioritize the optimization of faculty allocation by ensuring that teaching staff are distributed equitably across departments according to program size and specialization needs. Decision-makers are encouraged to monitor faculty workload and qualifications regularly, and to recruit or train faculty in areas where shortages or mismatches exist. A more balanced faculty structure promotes not only teaching quality but also student satisfaction and retention.

Second, while infrastructure investment shows a slightly lower impact than other factors, it remains fundamental to academic operations. The institution should invest in targeted facility upgrades, especially in spaces that support practical, interdisciplinary, and collaborative learning. This includes modernizing laboratories, improving classroom flexibility, and expanding access to library and self-study spaces. Regular maintenance and user feedback mechanisms are also essential to ensure facilities meet evolving academic needs.

Third, the strongest recommendation is for the institution to continue expanding and integrating learning technology resources across all programs. Given the high predictive strength of this variable, efforts should focus on upgrading digital platforms, providing training for faculty and students in technology use, and embedding interactive tools into teaching and assessment practices. A dedicated unit for digital

learning innovation may help sustain momentum and ensure consistency across departments.

From a policy perspective, institutional leaders should consider developing a resource allocation framework that aligns budgeting decisions with evidence-based priorities. By using data to guide where and how resources are deployed, the institution can enhance not only program effectiveness but also overall institutional performance.

Finally, for researchers and academic planners, this study highlights the importance of regularly evaluating the outcomes of internal investments. As educational environments continue to evolve—particularly with the rise of blended learning—resource allocation strategies must remain responsive, dynamic, and student-centered.

5.3 Further Study

While this study provides valuable insights into the relationship between resource allocation strategies and academic program effectiveness, there remain several areas that future research may explore to deepen understanding and broaden the applicability of the findings. First, future studies may consider adopting a longitudinal design to examine how changes in resource allocation over time influence academic program outcomes. A time-based approach could offer more dynamic insights into cause-and-effect relationships and institutional development.

Subsequent research should expand the sample scope to include multiple institutions across different regions or educational tiers. By comparing private and public universities, or institutions of varying sizes, researchers could identify contextual factors that shape the strength of input-output relationships in different settings. Such comparative studies might also reveal how institutional governance, funding models, or policy environments moderate the effectiveness of resource strategies.

Moreover, future research may incorporate qualitative methods such as interviews or focus groups to capture deeper perceptions and lived experiences of faculty and students. These insights could complement quantitative findings and uncover nuanced dimensions of resource impact that are not easily measured through surveys alone.

It is also worth exploring additional variables that may influence academic program effectiveness. For example, curriculum design quality, student motivation,

leadership practices, and external stakeholder involvement should be considered in future models to create a more holistic framework for analyzing educational effectiveness.

Finally, future researchers might investigate how digital transformation strategies, particularly artificial intelligence-assisted learning and data-driven decision-making systems, interact with traditional resource allocation to shape program outcomes. As educational institutions continue to evolve in the digital age, research in this area may provide timely and practical guidance for academic administrators.

While this study lays a solid foundation, future research efforts should continue building upon the findings to refine strategies for achieving excellence in higher education through effective and evidence-based resource management.

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Appendix

This questionnaire is part of an academic research study aiming to investigate how different resource allocation strategies affect academic program effectiveness at Donghai Institute of Education. Your responses will be kept strictly confidential and used solely for academic purposes. The survey consists of five parts: demographic information and four thematic sections. There are no right or wrong answers—please answer each question honestly based on your personal experience or observation.

All questions in Sections B to E use the following **5-point Likert scale**:
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Thank you for your valuable time and participation!

1. What is your role at Donghai Institute of Education?
   □ Faculty □ Student
2. What is your department?
   □ Humanities □ Science & Technology □ Business □ Education □ Other: _____
3. What is your gender?
   □ Male □ Female □ Prefer not to say
4. What is your age?
   □ Under 20 □ 21–30 □ 31–40 □ 41–50 □ Above 50
5. How many years have you been studying/working at this institution?
   □ Less than 1 year □ 1–3 years □ 4–6 years □ More than 6 years

6. There are enough faculty members to cover all required courses in my department.
   □ 1 □ 2 □ 3 □ 4 □ 5
7. The teaching staff in my department are appropriately qualified for the courses they teach.
   □ 1 □ 2 □ 3 □ 4 □ 5
8. Faculty members are evenly distributed across departments based on program needs.
   □ 1 □ 2 □ 3 □ 4 □ 5
9. Faculty are available and accessible to students for academic support.
   □ 1 □ 2 □ 3 □ 4 □ 5

10. The current faculty workload allows for effective teaching and course preparation.
□ 1 □ 2 □ 3 □ 4 □ 5

11. The classrooms are clean, comfortable, and well-equipped.
□ 1 □ 2 □ 3 □ 4 □ 5
12. Laboratories and specialized rooms meet the needs of practical courses.
□ 1 □ 2 □ 3 □ 4 □ 5
13. Library resources are sufficient and up-to-date.
□ 1 □ 2 □ 3 □ 4 □ 5
14. The institution provides adequate space for academic and extracurricular activities.
□ 1 □ 2 □ 3 □ 4 □ 5
15. Infrastructure improvements are regularly implemented and maintained.
□ 1 □ 2 □ 3 □ 4 □ 5

16. The institution provides reliable online learning platforms.
□ 1 □ 2 □ 3 □ 4 □ 5
17. Multimedia and smart classroom technologies are effectively used in teaching.
□ 1 □ 2 □ 3 □ 4 □ 5
18. Students and faculty are trained to use educational technologies.
□ 1 □ 2 □ 3 □ 4 □ 5
19. Learning technology resources enhance the flexibility of course delivery.
□ 1 □ 2 □ 3 □ 4 □ 5
20. Digital tools (e.g., forums, feedback systems) support better interaction and learning outcomes.
□ 1 □ 2 □ 3 □ 4 □ 5

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21. The program helps students achieve their academic goals.
□ 1 □ 2 □ 3 □ 4 □ 5
22. The curriculum is relevant to current industry or academic trends.
□ 1 □ 2 □ 3 □ 4 □ 5
23. Students are generally satisfied with the quality of the academic program.
□ 1 □ 2 □ 3 □ 4 □ 5
24. The academic program promotes critical thinking and practical skills.
□ 1 □ 2 □ 3 □ 4 □ 5
25. Overall, the academic program at this institution is effective.
□ 1 □ 2 □ 3 □ 4 □ 5

Thank you for completing this questionnaire. Your responses are greatly appreciated and will contribute meaningfully to the improvement of academic programs at Donghai Institute of Education.