

A STRUCTURED FRAMEWORK TO OPTIMIZE THE ALLOCATION OF TEACHING BUDGET--A CASE STUDY OF A LOCAL UNDERGRADUATE COLLEGE

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ABSTRACT

This article delves into the critical issue of optimizing the allocation of teaching budgets in local undergraduate colleges. The quality of education and overall learning experience hinges on this allocation, making it a crucial area of focus. The goal of the study is to uncover strategies that enhance educational outcomes and maximize resource utilization by improving budget allocation. Data collection involved an in-depth review of documents and gathering of budgetary information from 13 teaching faculties during the academic years 2022-2023. The study revealed several challenges with budget allocation, including approval bottlenecks, inconsistent standards, limited teacher involvement, lower modularity, instability and inconsistency, and weak planning. To address these issues, a structured framework is proposed that includes performance orientation, modular design, data-driven decision-making, and hierarchical budgeting. This framework aims to guide similar institutions in optimizing their teaching budgets, enhancing performance, and building institutional capabilities. Future research should explore interrelationships between budget modules, assess duplications, and refine the framework's Level 1 and Level 2 aspects, focusing on issues related to data-driven decision-making.

Keywords: Local Undergraduate Colleges; Allocation of Teaching Budget; Structured Framework

INTRODUCTION

To provide students with a quality education and a positive learning experience, it is crucial for local undergraduate colleges to effectively allocate their teaching budgets. Given that financial resources are limited, educational institutions must optimize their budget allocation strategies. The purpose of this paper is to explore ways to enhance the allocation of teaching budgets in local undergraduate colleges, to improve educational outcomes and maximize resource utilization. Proper allocation of teaching budgets can lead to a range of positive outcomes, such as improved teaching resources, enhanced faculty development programs, better technological infrastructure, and well-designed curriculum frameworks. By strategically allocating resources, institutions can enhance the quality of instruction, resulting in greater student engagement, retention, and academic achievement. Moreover, an optimized allocation of teaching budgets can promote the overall sustainability and financial health of the institution. By

ensuring efficient resource allocation, colleges can maximize their return on investment, streamline operations, and potentially attract more students by improving their reputation and quality of education.

OBJECTIVE

The purpose of this paper is to explore the problems and put forward a few strategies that can optimize the allocation of teaching budgets in local undergraduate colleges. The objectives of this paper are as follows:

1. To review existing literature on teaching budget allocation in undergraduate colleges and identify the key challenges and opportunities associated with it.
2. To analyze the problems existing in the teaching budget through case descriptions and data analysis.
3. To present a structured framework that can optimize the allocation of teaching budgets.

To achieve the above objectives, this research paper will address the following research questions:

1. What are the current challenges and opportunities associated with the allocation of teaching budgets in local undergraduate colleges?
2. What are the problems faced by local undergraduate colleges?
3. What strategies could be successfully employed to optimize the allocation of teaching budgets in local undergraduate colleges?

By answering these research questions, this paper aims to contribute to the existing body of knowledge and provide practical insights for educational institutions to undertake effective allocation of teaching budgets, ultimately leading to improved educational outcomes and institutional sustainability.

LITERATURE REVIEW

An Overview of Literature Review

In higher education, optimizing the allocation of teaching budgets is essential for institutions to effectively utilize their resources. This literature review examines key studies on strategies to optimize the allocation of teaching budgets in local undergraduate colleges.

In China, some researchers focus on the better allocation of financial resources of colleges and universities. Shi (2021) points out the problems of financial allocation: imperfect top-level design of financial resources, inadequate total quantity, and lower utilization efficiency. Yang (2005) puts forward two problems: lacking money management consciousness and a lower efficiency concept. Zhang (2008) thinks that financial resources have a problem of poor management, resulting in serious waste.

Miles, Karen Hawley; Darling-Hammond, Linda (1997), in the paper, *Rethinking the Allocation of Teaching Resources: Some Lessons from High Performing Schools*, try to develop a framework for re-examining the use of resources and a methodology that may be used to measure the extent to which schools use their resources in focused ways to support teaching and learning.

Nuwagaba (2013) argues that a failed higher education funding model would impact the economic development of the country and also if the higher education sector is underfunded, this will impact the quality of the graduates and the sector as a whole.

Nasrin Akhter, Abdul Majeed Khan, and Rehman (2018) found that the majority of the head teachers were not content with the budgets and funds provided to the schools, and they thought aspects of the procedures employed to be unhelpful.

Activity-based costing (ABC) has been widely discussed in the context of budgeting and resource allocation in higher education. Szatmary (2011) overviewed a few budget systems and made a comparison among incremental budgeting, proxy-based budgeting, traditional budgeting, activity-based budgeting and expanded activity-based budgeting, and he advocates the use of expanded activity-based budgeting, which is helpful for administrators to make relevant decisions about teaching affairs.

Analytical Features of the Literature Review

Based on the research on the teaching budget of local undergraduate colleges, the following consensus can be drawn:

Firstly, the teaching budget is a resource allocation, and its efficiency and effectiveness impact the school's teaching quality and students' learning outcomes.

Secondly, the teaching budget of local undergraduate colleges faces various challenges, such as budget constraints, inadequate funding, uneven distribution, and low efficiency.

Thirdly, innovative approaches are necessary to optimize budget methods, strategies, and techniques. These approaches include data-driven budget decision-making, collaborative decision-making strategies based on stakeholder involvement, budget strategies based on institutional priority strategies, and hybrid strategies that comprehensively consider institutional priority strategies, performance indicators, and stakeholder participation. Additionally, a budget model based on multi-variables, and a multi-objective budget structure framework based on teaching quality, equity, and efficiency are also important.

Further research should focus on local colleges and universities, exploring the existing challenges and problems in teaching budget allocation, and proposing specific budget optimization strategies based on theoretical research results.

METHODOLOGY

Definition of Terms

1. Teaching budget

The teaching budget referred to in this article specifically denotes the budgeting, approval, and allocation activities undertaken by the financial department, academic affairs department, and teaching faculty of local undergraduate colleges.

These activities are based on factors such as the development strategy of the teaching faculty, the characteristics of academic programs, student and faculty numbers, as well as the practical needs of professional and curriculum development, faculty growth, teaching research, student practical experiences, and the operation and maintenance of experimental and training laboratories.

The teaching budget, as mentioned in this article, excludes the salary and benefits of teaching staff, the acquisition of school library resources, digital campus development, and the construction of educational and teaching infrastructure.

2. The local undergraduate colleges

In the context of higher education in China, "local undergraduate colleges" typically refers to institutions that provide undergraduate education and are primarily funded and governed by local government authorities. According to the latest statistics from the Ministry of Education of the People's

Republic of China, as of the end of 2023, there are a total of 1239 regular undergraduate institutions nationwide. Excluding the 114 institutions directly under central authorities and ministries, the number of local regular undergraduate institutions amounts to 1125, accounting for a proportion of 90.7%. These colleges are often situated at the provincial or municipal level and play a crucial role in offering tertiary education to students within a specific region.

Data collect

Document overview: This paper compiles documentation related to teaching budgets from the college under consideration in the case study. The focus of the document review centers on the budgeting process and budgetary standards.

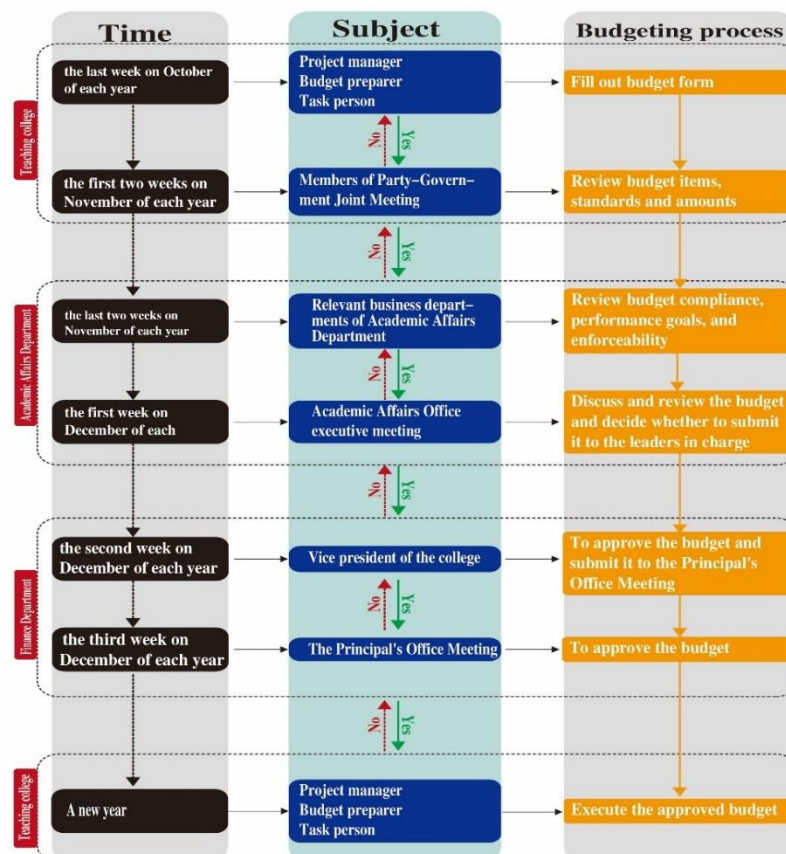
Budgeting Data: The study gathered budgetary information for the academic years 2022-2023 from 13 individual teaching faculties within the selected case study college. The collected data encompassed the number of budgeted items and allocated budget amounts.

Budget Allocation Data: Additionally, this research collected budget allocation data for the academic years 2022-2023 from the same 13 individual teaching faculties within the case study college. The compiled information includes the number of approved budgetary items and their respective allocated budget amounts.

RESULTS

Budget procedures

By analyzing the budget-related documents of the case school, such as the "Financial Management Measures", "Budget Management Measures" and "Teaching Fund Investment Guarantee Methods (Trial)", we can obtain from the four dimensions of budget time, budget subject, budget process, and responsible department. Prepare the annual budget flow chart, as follows:



By analyzing this flow chart, the case school has the following problems in the process of budget allocation:

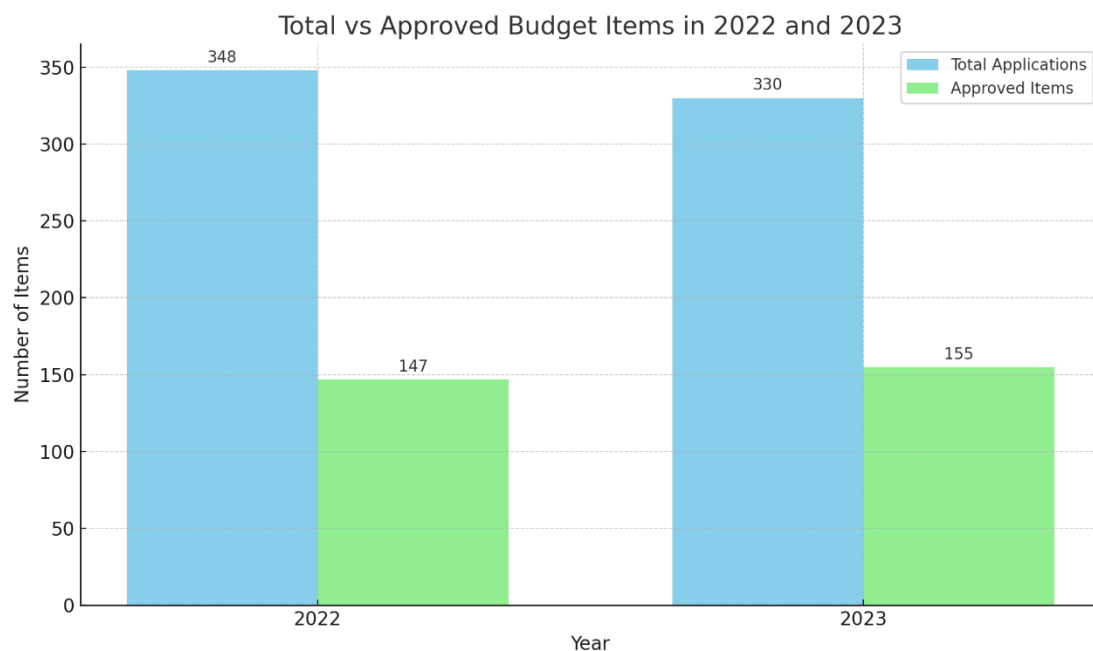
Approval Bottleneck : The process involves multiple stages of submission and approval, and it takes at least two months from budget preparation to the end of the budget approval process. Delays or bottlenecks may occur if these stages are not efficiently managed, impacting the overall budgeting timeline.

Inconsistencies in Project Standards : Analyze the relevant systems related to budget standards of the case school, such as "Measures for the Management of Subject and Professional Competitions (Trial)", "Measures for the Management of Teaching Project Funds", "Measures for the Management of Practical Teaching Funds (Trial)", "Measures for the Implementation and Management of Special Financial Budgets (Trial)", etc. , it was found that the system standards related to teaching budget in the case school are not perfect, and there is a lack of relevant system standards related to teacher training, teaching infrastructure repair and maintenance, experimental training room maintenance fees, and teaching business fees. The lack of these system standards may lead to the same budget items Inconsistent between different teaching schools.

Insufficient Involvement of Teachers: The budget process ignores the dominant position of teaching colleges and the dominant role of teachers. The main role of teaching colleges in budgeting has been weakened, which is not conducive to improving the performance of budget funds.

These potential issues highlight the importance of establishing streamlined communication, standardized procedures, and transparent decision-making throughout the budget allocation process. There is a need to establish a budget framework that can effectively address the above issues.

Total and Approved Budget Items



Lower modularity of the annual teaching budget

Analyzing Figure 2, the total number of teaching budget items for the two years is substantial, with 348 budget items in 2022 and 330 budget items in 2023. However, the actual approved budget items are only 147 and 155 for 2022 and 2023, respectively. The approved and executed budget items represent only 42% and 47% of the total budget items. The data indicates that the modularity of the teaching budget in the case university is low. A high number of teaching budget items can result in a substantial workload for later-stage reviews and approvals.

Budget and Allocated Budget

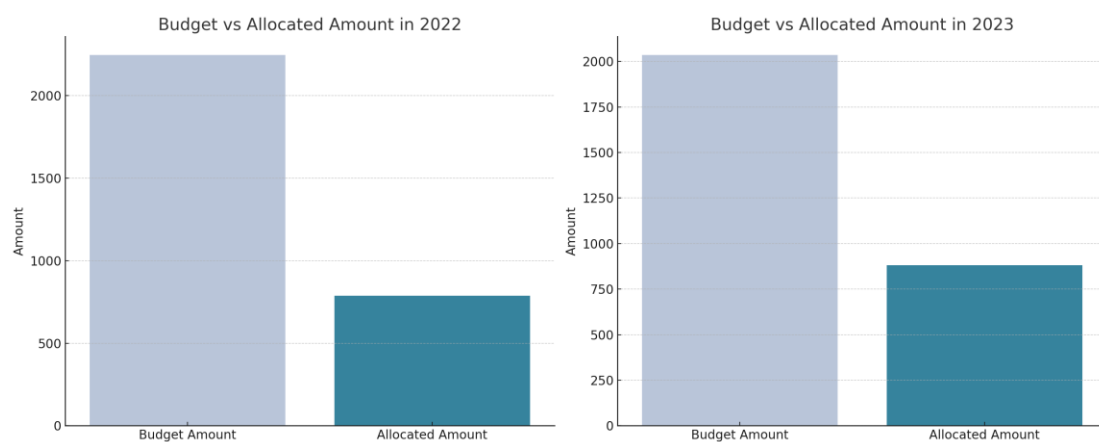


Figure 3: Budget and Allocated Budget in 2022-2023

The teaching budget lacks organization and management, demonstrating poor planning. From Figure 3, there is a significant disparity between the budget allocation and the approved budget. In 2022, the teaching faculty applied for a budget of 11.2393 million yuan, while the actual allocated budget was only 3.9341 million yuan. In 2023, the teaching faculty applied for a budget of 10.7058 million yuan, with the actual allocated budget being only 4.4038 million yuan. The percentage of the actual allocated budget to the applied budget for the two years is 35% and 41%, respectively.

This deviation may also indicate that the institutional standards related to teaching budgets are not sound. During the budgeting process, personnel involved in budget preparation may lack understanding of the system. Communication mechanisms between budget preparers, teaching faculties, and academic affairs departments may also be ineffective.

Consistency and Stability

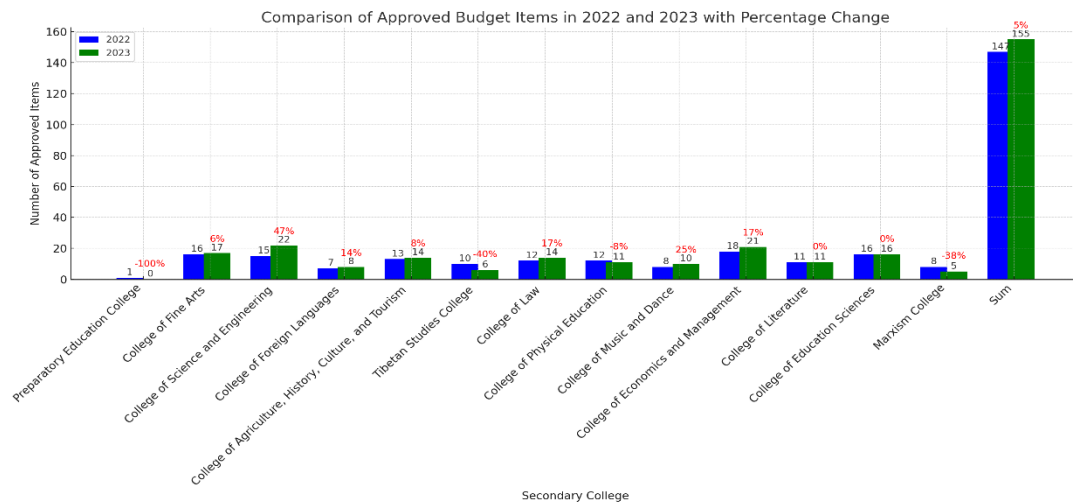


Figure 4: Comparison of Approved Budget Items in 2022-2023 with Percentage Change

Instability and Inconsistency of the Teaching Budget

Variability: Most colleges have experienced some level of fluctuation in the number of approved projects between the two years, indicating a certain degree of variability. Some colleges have seen a significant increase in the number of approved projects in 2023, while others have seen a decrease.

Increasing Trends: Some colleges, such as the "College of Science and Engineering" and the "College of Agriculture, History, Culture, and Tourism," have shown a noticeable increase in the number of approved projects in 2023 compared to 2022. This suggests that these colleges may have received more budget approvals or have had an increased demand for projects.

Decreasing Trends: Conversely, some colleges, like the "Preparatory Education College," have experienced a decrease in the number of approved projects in 2023 compared to 2022. This may indicate a reduction in the budget needs of that college or adjustments in budget allocation.

DISCUSSION

Through the analysis of the budget process and relevant data for the teaching budgets in the academic years 2022-2023, the case college faces issues such as budget approval bottlenecks, inconsistent budget standards, insufficient teacher involvement, inadequate modularity in budgeting, weak planning in budgeting, and a lack of consistency and stability in annual budgets. Combining relevant research findings with the actual situation of the case college, this paper suggests that a budget framework should be established that is performance-oriented, modular project design, data-driven, and includes hierarchical allocation.

Performance-based budgeting

Chinese public universities primarily rely on government fiscal budgets for their operational funds. The limited nature of education funding determines that when allocating educational funds, due consideration should be given to the level of the university's contribution to local economic and social development. This is reflected in the performance level demonstrated by the university in its educational activities. The case university's provincial-level education administrative authority released the "Performance Indicator Scoring Rules" in 2022. In the allocation of annual performance, a performance assessment of local undergraduate colleges is conducted first. After determining the performance level, performance allocation follows.

Performance orientation means that when the case university determines budgetary projects for teaching faculties, it must prioritize the performance indicators related to education in the "Performance Indicator Scoring Rules" to determine budgetary projects. These indicators include:

- 1. Disciplinary and Professional Development**

- Construction of "Double First-Class" Disciplines.
- Professional Development.
- Number of Doctoral and master's degree Programs.
- Professional Accreditation.
- Transformation and Development of Applied Undergraduate Programs.

- 2. Teaching Practice**

- Teaching-oriented practical projects, undergraduate innovation, and entrepreneurship training programs.
- Teaching Achievement Awards.
- Teaching Material Development.
- Construction of Four New Initiatives.
- University Student Competitions, Innovation and Entrepreneurship Competitions.
- Sports and Arts Exhibition Activities.
- Military Course Teaching.

- 3. Curriculum Development**

- Construction of First-Class Courses
- Ideological and Political Education in Courses

- 4. Student Physical Health**

- 5. Teaching Evaluation and Quality of Graduation Theses**

Modular Project Design of Budget Items

Principle of Project Integration: This involves the establishment of three budget modules: basic budget, performance budget, and special budget. All budget items are incorporated into these three

modules. The basic budget reflects fairness, with variables including discipline categories, number of disciplines, student enrollment, and faculty size. The performance budget can be divided into teaching construction, teaching maintenance, and teaching reform and research categories, with variables set based on the work items covered in each category. The special budget specifically refers to work items explicitly required by higher education administrative authorities to be included in the budget, usually with student enrollment as a variable.

Principle of Performance Priority: Prioritize budget allocation to key disciplines that align with the school's development strategy. Emphasis is placed on supporting projects such as majors, courses, construction of labs, student competitions, and teaching reform and research projects that have been approved by the provincial-level education administrative authority.

Principle of Quantifiability: Adhere to data-driven decision-making. Variables included in the three budget modules can be quantified based on quantity and level for ease of calculation.

Data-driven

Data-driven refers to the process of making informed and strategic choices by relying on empirical evidence and data analysis rather than intuition or personal judgment. In the realm of budget allocation for undergraduate colleges, data-driven decision-making plays a crucial role in enhancing efficiency, transparency, and effectiveness. By leveraging data analytics, colleges can assess various factors such as student enrollment, academic performance, faculty workload, and research output to inform budgetary decisions.

Applying the data-driven principle in teaching budget demands that academic administrators in the academic affairs department possess the capability to collect and analyze data comprehensively. This involves collecting complete information on students, faculty, disciplines, laboratory, and off-campus practical training facilities, ongoing teaching construction projects, and teaching reform and research projects. The collected data should be updated annually to ensure its timeliness and accuracy, emphasizing the need for academic managers to maintain proficiency in data collection and analysis.

Hierarchical Budget Allocation

Hierarchical budgeting in local colleges refers to assigning different budget emphases to projects proposed and constructed at the national, provincial, and institutional levels. For instance, in the teaching budget, differentiation among disciplines can be implemented. For liberal arts disciplines, a basic value of "1" may be assigned, for arts disciplines, a value of "1.1," and for science and engineering disciplines, a value of "1.3" could be assigned. Similarly, projects related to professional development, curriculum construction, and teaching reform and research are assigned hierarchical values. For instance, a university-level curriculum construction project may be assigned a value of "1," a provincial-level project "1.1," and a national-level project "1.3." This hierarchical valuation method not only reflects the incentive-driven and data-driven principles of budgeting but also ensures the effective implementation of national education policies from the grassroots level upwards throughout the entire process.

Based on the principles of performance orientation, modular budget design, data-driven decision-making, and hierarchical budgeting, the following budget framework can be designed.

Modules	Level 1	Level 2
Basic Module	Student enrollment	Number of students
		Student source categories
	Majors	Number of majors
		New majors
	Categories of majors	Liberal Arts
		Science and Engineering
		Arts and sports
	Number of teaching staff	Number of normal teachers
		High-level talents
Performance Indicators Module	Construction projects	Professional construction projects
		Curriculum Construction Project
		Course ideological and political Construction
		Construction of experimental and training laboratories.
		Construction of off-campus practical education bases.
	Teaching Maintenance and Operation	Part-time external teachers
		Lectures on teaching
		Student internship practice
		Maintenance costs for experimental and training laboratories
		Teacher practical training
	Professional Competitions	Provincial competitions
		School-level selection competition for provincial professional competitions
		Planned college-level competitions
	Teaching Reform and Research	Higher education talent training quality and teaching reform project
		National Ethnic Affairs Commission Education and Teaching Reform Research Project
		"Four New" construction projects
Special Projects	Construction of ideological and political theory courses	Number of students

Modules	Level 1	Level 2
	Sports maintenance: including physical health tests of college students, student sports games, purchase and maintenance of public sports facilities, etc.	Number of students
	Promote and popularize the national common spoken and written language	Number of students
	College Student Mental Health Education and Counseling Center	Number of students

CONCLUSION AND IMPLICATIONS

This article, through a review of documents related to teaching budgets at a specific university and an analysis of data from teaching budgets of 13 teaching colleges for the academic years 2022-2023, identifies issues such as budget approval bottlenecks, inconsistent budget standards, lower teacher involvement, insufficient modularity in budgeting, weak budget planning, and a lack of consistency and stability in the budgeting process at the university.

In response to these issues, the article proposes the establishment of an integrated budget framework that incorporates performance orientation, modular budget project design, data-driven decision-making, and hierarchical budgeting.

This study is a case analysis, and the identified issues serve as references for similar universities, aiming to guide measures to overcome these problems in teaching budgets. The proposed budget framework is a structural guide that can be adapted and utilized by similar institutions. Overall, the identified issues and the structural framework contribute to optimizing teaching budgets, enhancing budget performance, and strengthening the university's ability to serve local economic and social development.

Further research should focus on the interrelationships between budget modules and determining their proportional allocations. Similar issues may also exist at the Level 1 of the budget structure framework. At Level 2, emphasis should be placed on whether there are duplications among budget items, whether certain items that should be included have been overlooked, and if there are items included that should not be part of the budget framework. Lastly, a critical issue is how to assign values to each budget item within the proposed framework, representing a key aspect of data-driven decision-making.

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