

Research on the Construction and Practice of the "Two-Way Feedback Mechanism between Teachers and Students" in the Implementation of Undergraduate Teaching Management Policies at Secondary Colleges of Private Universities

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Abstract: In the course of teaching management at secondary schools under private universities, there are bottlenecks in the flow of information among teachers and students due to asymmetric paths, signal attenuation and organisational restrictions. A two-way feedback mechanism, asymmetric distribution of upward and downward feedback paths, signal attenuation and noise interference at the interface, and constraints on the efficiency of feedback due to organizational structure have all been studied in this paper. Therefore, based on the decomposition of teaching links, it has established a hierarchy of feedback nodes and trigger conditions, clarified the types of collected information, set up a hierarchical process and division of responsibilities, and built a double-loop closed-loop adjustment mechanism under conditions of asymmetric information. At the same time, it should meet the three supporting paths: match the trigger conditions of the response with the timeliness of the trigger, redefine teacher-student roles and reshape interaction rules, integrate multi-source feedback data with visual linkage, and thus provide an operating basis for improving the quality of feedback in the implementation of teaching management.

Keywords: Private Universities, Secondary Schools, Teaching Management Implementation, Two-way Feedback between Teachers and Students, Closed-loop Adjustment, Information Attenuation

Introduction

The implementation of undergraduate teaching management at secondary colleges of private universities has the characteristics of limited resource allocation authority, a simplified organisational hierarchy and the existence of professional barriers; thus, the traditional model of one-way directive management is not suitable for meeting the demand for real-time information exchange among teachers and students during class hours. At the top of the teaching management chain, a good operation of the feedback mechanism will directly affect how quickly we can find and address problems in teaching. However, there are many practical problems with the feedback process in many secondary schools at present, such as an asymmetric path, signal distortion and processing delay; as a result, upward opinions from students cannot be turned into regulatory measures at the management level, and downward feedback from teachers cannot promptly address students' learning difficulties. Therefore, we need to study the construction logic and operating conditions of the two-way feedback mechanism among teachers and students systematically from the inside, in terms of the implementation of teaching management. The purpose of this paper is to build our own system; that is, we will apply it to specific links in the daily teaching process at secondary schools to find out how to construct a set of design methods for a feedback mechanism that is hierarchical, accountable and visualisable, thereby improving the ability to understand front-line information and enhancing the efficiency of teaching management implementation.

1. Theoretical Basis and Operational Logic of the Feedback Mechanism in Teaching Management Implementation

1.1 Functional Position of the Embedded Feedback Mechanism in the Process of Teaching Management Implementation

At the stage of carrying out teaching management, feedback is not an external addition but a control tool that should be integrated into the basic functions of planning, organisation, coordination and leadership. The purpose of the above is to know the current situation of teaching activities and correct any deviations promptly. Teachers and students will be given different instructions at the level of implementation, and in response, they will exhibit various behaviours and achieve different results. The feedback mechanism is to determine how far the actual output is from the desired goal and then send this difference information back to the management node. At this time, the management node can change the next instruction without stopping the whole process. Due to the small allocation authority of private universities for secondary schools, the implementation of teaching management is often unstable. Based on the above, the feedback mechanism will help to reduce information asymmetry and provide management with timely and accurate information from the front line of teaching. Intervention via the feedback mechanism has also changed the form of support for management nodes in teaching; they are no longer fixed according to plans but change constantly. Therefore, the goal of the feedback mechanism is close to that of an information calibrator in the teaching management system and not merely an assessment instrument^[1].

1.2 Structural Features of Two-way Feedback between Teachers and Students in the Organizational Field of Secondary Schools

The organisation of secondary colleges in private universities has a simple hierarchy and professional barriers, so the two-way feedback between teachers and students takes the form of asymmetric dual channels. The feedback teachers give to students is usually in the form of course progress reports, comments on homework, explanations of test standards, etc., and its channel is relatively clear and easy to track. At the same time, the feedback teachers receive from students is also more scattered; it includes all sorts of content, such as understanding of class materials, perceived workload, evaluation of teaching speed, etc., and its collection is often based on the teacher's own initiative. The structure of two-way feedback is also a filter for the vertical transmission of information; that is, students tend to provide feedback on problems they believe are "resolvable" and fail to offer structural opinions on the overall course design. Therefore, the teacher does not have all the information about the teaching conditions. The second level of this structure is secondary schools, and they will collect the scattered opinions of students to create a general report for the school. At the same time, this intermediate layer must also deal with the problem of information overload and information distortion, and it is necessary to keep the main semantics of the original feedback during aggregation.

1.3 Coupling Relationship between Feedback Information Flow and the Closed-loop of Teaching Management

The entire path of the feedback information, from collection to use, is the actual content of the closed-loop in teaching management. The coupling relationship is mainly expressed by the degree of match between the timing arrangement of information flow and the regulatory actions of management nodes. When the feedback information can be obtained, processed and returned in the same teaching cycle, the management node will adjust the next teaching activities according to this information to form a closed-loop adjustment. If the flow of information is several months or a semester long, only the next round of teaching plans will be affected by the feedback, and the closed-loop effect will be greatly reduced. A typical situation in secondary colleges of private universities is that students' opinions on a course are only collected after the course has been held; by that time, it is no longer possible to improve the teaching experience for the current group of students. To strengthen this link, one should reduce the processing time of feedback information and establish a response window that is in line with the speed of teaching. The sensitivity of the closed-loop for teaching management depends on whether the feedback information can be used in the decision-making process at the right time, and not on how rich that information is. In addition, in order to make the closed-loop function proper, the management node needs to know whether the adjustment is reversible or not, and should avoid making a permanent change at a time when it is not necessary^[2].

2. Current Obstructive Phenomena and Cause Analysis of the Feedback Process in Secondary Colleges of Private Universities

2.1 Asymmetric Distribution of Upward and Downward Feedback Paths in the Teaching Management Chain

At the bottom of the chain for teaching management, feedback to teachers and students usually goes through official channels, such as academic notices, minutes of teaching meetings and explanations for course modifications; these have clear information flow and explicit directive characteristics. At the same time, the main form of the upward feedback path is teaching opinions submitted by students, immediate Q&A in class and informal after-school communication; generally, these ways have a low density of information collection and poor transmission efficiency. The asymmetry can be seen from the fact that the time cost for management nodes to send down instructions is much lower than the time needed to obtain authentic feedback from the front line of teaching. A typical situation in secondary schools is that teachers can quickly obtain downward information, such as teaching progress plans, but upward feedback from students on issues such as course difficulty and lecture speed is difficult to collect completely at all levels of management. One of the reasons for this difference in distribution is that upward feedback needs to go through many screening and retransmission links, and at each link, some information may be lost; downward feedback does not have this problem. Downward feedback generally has a fixed period and needs to be corrected promptly by the receiver; upward feedback does not have such a reverse pressure device, and its frequency of occurrence is only limited by the work inertia of the intermediate links.

2.2 Specific Manifestations of Feedback Signal Attenuation and Noise Interference in the Teacher-Student Interaction Interface

The first place that feedback information is generated is the teacher-student interaction interface, and it is also the most likely to have signal attenuation and noise interference. Signal attenuation is a gradual decrease in the quantity of information in the feedback that students can obtain after transmission. For example, a student said that "the audio speed of a certain chapter is too fast, and there are many linking sounds; it is difficult to take notes". After being retranslated by the class representative, summarised by the information officer, and organised by the academic assistant, this information was simplified to "the listening course pace is relatively fast". All original references to specific chapters, problems with linking sounds, difficulties in note-taking, etc., have been removed, and no more targeted improvements by teachers will be made. Noise interference is the addition of random errors and other undesirable fluctuations in the feedback channel. For instance, students may believe that their own scheduling conflict is due to too much homework, and teachers may fail to grasp the issue because they have formed a wrong idea about what the students said in oral feedback. The ratio of students to teachers in the secondary college of private universities is relatively small, and teachers have little time for collecting and analysing feedback both during and outside of class; thus, the level of signal attenuation and noise interference is relatively high. There is no fixed structure for the transmission chain of information, and each intermediary will re-encode the original feedback according to its own understanding. The encoding rules are not the same, so they will look different after being transmitted over different paths^[3].

2.3 Constraints of Organizational Structure on the Processing and Transmission Efficiency of Feedback Information

Most secondary schools have a relatively large organisation with various departments, such as the teaching and research office, the teaching office, the student affairs office, laboratories, etc., and the processing and dissemination of feedback information need to go through many departments. All handoff points are potential sources of inefficiency because the different departments have various classifications for priority and other ways of handling feedback information. For example, one of the problems students have reported is that "the experimental equipment is not working properly"; this could be due to any of the three reasons mentioned above: equipment maintenance, course scheduling or course content design. After the information reaches all the departments, it is often difficult to centralise it. The number of hierarchical levels is also relatively large, and as the information is repeatedly summarised and restated at each level in the hierarchy, a considerable amount of the original detail has been lost by the time it reaches college management. There are relatively few administrative staff at secondary colleges in private universities, and the number of people responsible for processing

teaching information is also small; therefore, a large amount of feedback information is left at the collection stage and does not reach the links for in-depth processing and effective dissemination. The problem of information silos among departments has further exacerbated the issue of feedback integration; that is to say, each department only handles the part directly related to its own functions, and cross-departmental feedback information is often repeatedly shelved at the handover points.

3. Framework Design of the Two-way Feedback Mechanism for Teaching Management Optimisation

3.1 Hierarchical Feedback Nodes and Trigger Criteria Based on the Decomposition of Teaching Links

The basic links of the teaching activities can be arranged in chronological order, such as pre-class preparation, in-class teaching, after-class practice and stage assessment, and independent feedback nodes can be added to each link. The feedback node in the pre-class link is used to determine how well the students have grasped the preview material, and we can set a trigger condition such that if more than half of the students who have finished the preview task request further explanations for a particular section, then this condition will be met. The feedback node in the classroom instruction link focuses on the speed of explanation and the adaptability of cases, and its trigger condition is that the same category of questions has been asked in the in-class immediate Q&A more than three times. The feedback nodes in the after-class practice and stage assessment links focus on the distribution of workload and difficulty, and the trigger condition is that the number of questions submitted by students in a certain period exceeds the set limit. The hierarchy above will help us know exactly what in class needs to be corrected, rather than just saying that there are general problems with the class. Each node is a different trigger condition, so there is no ambiguity in the information collection stage, and it can be taken as the starting point for the next step.

3.2 Categorization of Collection, Hierarchical Processing and Responsibility Attribution for Two-way Feedback Information

Organise the collected two-way feedback into categories such as the speed of teaching, difficulty of content, amount of homework, assessment methods, interactive experience and classroom effect according to the characteristics of the content, and these categories will be handled differently. Teaching pace information refers to changes in course progress and should be managed by the teaching and research office; content difficulty information relates to the depth of explanation and supplementary materials, and it should be handled at the level of a course group; homework load and assessment method information concern grading standards and workload distribution, so this should be managed by the program head; interactive experience information is related to teacher-student communication methods and classroom organization forms, and it should be managed independently by the instructor. At the top of the hierarchy is the person responsible for all feedback, so it does not need to be handled by several departments unnecessarily. Attribution of responsibility is based on the "first-contact responsibility plus hierarchical adjudication" model; that is to say, the person who first obtains the feedback information is responsible for classifying and distributing it, and if a certain level cannot solve the problem independently, it will be escalated to a higher level, and that higher level will provide a handling opinion and inform the information submitter^[4].

3.3 Formation of a Closed-loop Adjustment and Dynamic Correction Mechanism under Asymmetric Information Conditions

During the teaching of management implementation, the management node is responsible for the general planning of teaching arrangements, teachers and students are aware of small deviations in the specific implementation process, and the two parties are in a typical state of asymmetric information. The Design of the closed-loop adjustment mechanism should be able to correct the teaching behaviour dynamically without knowing all the information on both sides. The kind of the feedback loop is a double-loop structure, and the short-cycle and long-cycle loops work together. A short-cycle loop is one lesson or one week of teaching; it addresses problems that can be corrected immediately, such as adding a case study or slowing down the speed of explanation for a particular section. The long-cycle loop is one semester or a whole school year, and it is used to adjust the general framework of the course, such as adding or removing a teaching module and redesigning the assessment ratio. The basis of the

dynamic correction mechanism is that every adjustment action will lead to changes in teaching behaviour, and these modifications will then be used as feedback for repeated adjustment in the loop. Given the problem of asymmetric information, the function of management nodes is not to reduce the information gap among parties but to build an early warning system that can promptly respond to local observations made by teachers and students and adjust teaching at a low cost.

4. Supporting Paths for Embedding the Feedback Mechanism in the Operation of Teaching Management in Secondary Schools

4.1 Matching Method for Feedback Trigger Conditions and Response Timeliness in Daily Teaching Activities

The conditions for the feedback trigger in the daily teaching activities should be set according to the different speeds of the teaching activities. In the pre-class preparation stage, the trigger condition is that the number of preview questions submitted by students reaches a certain level, and the corresponding response timeliness is to complete the Q&A preparation before the next class. Promptly find out which students have been called upon to ask questions in class by observing their behaviour and analysing the questions from the low-correct-rate section of the classroom response system; based on this information, adjustments can be made to the current lesson content or supplementary explanations will be provided after class. At the stage of after-class homework and experiment report feedback, the prompt for this feedback is the objection raised by students after seeing the graded results, and the reply deadline is three teaching days. The basis of the matching method is to set a particular time window for each type of trigger condition, and if there is no response within this window, it is assumed that the feedback process has ended. The course schedules at secondary schools in private universities are generally full, and the gaps between different types of classes are quite long. Therefore, different response time standards should be set for the theoretical course, the laboratory course and the internship and practical training course. The longest delay in getting feedback for the theoretical course is one week; therefore, the laboratory courses need to be shortened so that feedback can be obtained before the next experiment, given the continuity requirements for equipment and materials.

4.2 Role Definition of Teachers and Students in the Feedback Process and Reshaping of Interaction Rules

Teachers are in the process of giving and receiving feedback, and at this time, they will both be given and provide feedback. They need to find out what the students are saying in the process and return the results of that analysis to the students in an easy-to-understand way. The role of students has changed from that of passive recipients of information to active providers of feedback, and all the feedback provided will be taken into account. The change in the interaction rule can be expressed in three ways. First, the start of feedback is no longer due to the special organisation of opinion-collection activities; rather, it occurs during the two-to-three-minute open Q&A session at the end of each lesson. Second, after obtaining the information, the receiver needs to update the status of this information with tags, such as "read", "processing", "transferred" or "closed", and these tags will be visible to the initiator. Third, if the same problem has been mentioned several times in the feedback stage and no correction has been made, an automatic escalation mechanism will be triggered to have a higher-level processing node address the issue. The Design of this rule will give teachers and students more equal rights and responsibilities in the feedback process, and reduce the problems of unclear roles and lost information.

4.3 Integration, Visualisation and Linkage of Multi-source Feedback Data with Teaching Modification

Feedback data from all the places mentioned above—class observations, assignment comments, after-class Q&A, teacher opinions, student information officers' feedback—are in various forms and at different levels of detail. First, a single set of data fields will be created in the organisation to store the six basic attributes of the information: feedback source, time of occurrence, relevant course and chapter, type of issue, urgency level and processing status. Organize the data and then present it in an easy-to-understand way; some typical types are maps of the distribution of feedback hot spots, donut charts showing the proportion of various problems, and line charts of response time trends. The hotspot distribution map shows the three most frequently mentioned specific problems in each teaching chapter;

the donut chart shows the proportion of categories such as teaching speed, content difficulty and homework volume; and the line chart shows the trend of the mean time to reply to feedback over the course of a semester. The Teaching Adjustment Stage directly employs the visual results. At the teaching meeting held every four weeks, the course group will decide whether to change the explanation method for the next chapters based on the distribution map of hot spots, judge whether it is necessary to reallocate the investment of effort among different links in teaching according to the donut chart, and assess whether the operating efficiency of the current feedback process is within an acceptable range based on the line chart. The three kinds of visual output work together to offer a basis for adjusting teaching and thus form a closed-loop link of data-action.

Conclusion

First, this paper will introduce the theoretical basis of the feedback mechanism in teaching management implementation; next, it will analyze the typical obstructive phenomena and their causes in the feedback process of secondary colleges at private universities; then, a framework for the two-way feedback mechanism of teaching management optimisation will be proposed; finally, supporting paths for the implementation of this feedback mechanism in operations will be designed. Based on the above study, the feedback mechanism should not be added externally to the management of teaching; instead, it should be integrated into the functions of planning, organisation, coordination and control as a regulatory tool. The main reasons for the lack of effect of feedback are the asymmetric distribution of upward and downward feedback paths, signal attenuation and noise interference, and the information silo effect in the organisation. Hierarchical node decomposition based on the division of teaching links, category collection and hierarchical processing, dual-loop closed-loop adjustment, trigger timeliness matching in daily activities, reshaping of role rules, and data visualization linkage can be employed to build a lightweight feedback mechanism for secondary colleges of private universities. In the future, we will test the transferability of this mechanism in secondary colleges of different types of private universities, explore automatic feedback triggering tools based on learning analytics technology, and investigate the cumulative effects and boundary conditions of teaching adjustment behaviour in long-cycle feedback loops.

Fund Projects

This paper is supported by the 2026 University-level Teaching Reform Research and Practice Project of Zhengzhou University of Economics and Business (Project No. jg26155).

References

- [1] Pang, P., He, M., & Wang, X. (2024). *Reform Dilemmas and Path Innovation of the Governance System of Secondary Colleges in Private Universities in the New Era*. *University*, (4), 153-156.
- [2] Wu, Q. (2023). *Exploration and Practice of Teaching Management in Private Undergraduate Universities-Taking the Software Engineering Major of Zhangjiajie College of Jishou University as an Example*. In *Proceedings of the 7th Innovative Education Academic Conference* (Ed. Zhangjiajie College of Jishou University), pp. 288-289.
- [3] Li, X., et al. (2022). *Application of the 'People-oriented Flexible Management' Method in Undergraduate Teaching Management of Secondary Colleges in Universities*. *China Management Informationization*, 25(3), 198-203.
- [4] Zhu, L., Lu, C., & Li, Z. (2021). *Practice and Exploration of Improving Teaching Quality in Private Universities Based on OBE Concept*. *Modern Communication*, (20), 17-19.