Reform and Exploration of Experimental Teaching in Public Administration under the Background of Smart Education

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Abstract: On the background of smart education that is changing the way teaching in higher education is done, by shifting the emphasis on resource digitalization to process intelligence, there an urgent need to alter the previous activities of experimental teaching in the area of public administration. It should not only aim at elucidating the cases but also provide the training on decisions and develop the skills of teamwork. This paper reshapes the objectives of the course from a competency perspective, employing a four-stage task chain of "basic—comprehensive—situational— collaborative," integrating policy text interpretation, open data utilization, solution balancing, and scenario simulation to form a coherent output process. It relies on platform traces to collect process evidence and creates a formative evaluation cycle. Verification is conducted using multi-source evidence (platform logs, submission records, version history, and scale scores) from the pilot course. The results show that key indicators such as preparation, evidence utilization, decision-making process recording, and revisions after feedback exhibit a traceable growth trend, and the team's output and collaborative structure remain within a reasonable range.

1. Introduction

Smart education is moving from resource digitization to process intelligence. Against this backdrop, public operation experimental teaching urgently needs to transform from "lecturing/experience" to "evidence-driven ability output" in order to address limitations such as of task progression, untraceable evidence, biased and subjective evaluation, and compliance and burden. Yang et al. pointed out the importance of situational tasks and the integration of theory and practice for the development of abilities [1]; Liu et al. indicated that the value of the platform lies in institutionalized operation mechanism [2]; Liang and Gong emphasized the critical thinking ability framework [3]; Lee and Lee believed that teachers are the key role in curriculum redesign in technological change [4]; Han and Fu gave the logic of "experiment-learning-diffusion" [5]; the new liberal arts experimental teaching reform focuses on the consistency of goals, resources and evaluation [6]; intelligent education research shows that technology should serve the process and provide feedback [7]; OBE-CDIO emphasizes goal alignment, process protection and multi-dimensional evaluation[8]; the summary of information-based experimental curriculum reform mentions that attention should be paid to method integration and evidence coagulation [9]; the data-driven knowledge identification framework proposed by Nie et al. provides a methodological reference for process analysis and protection [10-11]. Based on this, this paper focuses on shaping a sustainable solution with "progressive task chains, verifiable evidence chains, and closed-loop feedback chains." It reshapes the goals and task chains, creates appropriate process evidence and evaluation criteria, and utilizes pilot courses to integrate literature review, surveys, observation records, output analysis, and interview logs for cross-validation[12]. Current Situation and Needs: Where Does the Key Contradiction Lie?

1.1 Current Situation: Common Practices and Major Shortcomings of Experimental Teaching

Most universities have established a relatively stable framework for public-operation experimental teaching: "case exchange—scenario simulation—report generation." This framework

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focuses on interpreting policy texts and discussing typical cases, supplemented by classroom simulation activities such as hearings/emergency response[13]. At the end of the course, student performance is evaluated through project reports or results presentations. This model has some benefits in practice, such as: controllable organizational costs, applicability to large classes, and the capability to show the learning process of doing in the limited time of a single class. Nevertheless, its drawbacks are equally significant[13]. It is common that tasks are done at once, not in stages, and without weekly updates, which does not allow the content created by students to be transformed into skills that can be transferred.

The experimental sessions frequently provide clear explanation of governance scenario but cannot reach the level of thorough implementation[14]. Actually, there is a problem with incomplete data of public affairs, lack of inter-departmental cooperation, blocked access to public communication and its limited observance. These problems can be easily simplified, so that student training is limited to the ability to express opinions and collect materials, which makes it hard to show the reasoning behind decisions and prove them with evidence. The importance of this study is based on the idea of applying the concept of task chain and evidence chain to allow making a systematic decision about the current situation, stating why there are numerous activities but no changes in capabilities, and offering examinable improvement options to the future reforms, rather than just using experiential stories[15].

1.2 Alignment of Competency Requirements: Mismatch between Job Competencies and Training Points

The requirements of employers to have a workforce of public operations professionals are changing in the sphere of smart education and digital government. They are no longer simply requiring "familiarity with systems and processes," but are beginning to emphasize "conducting governance actions based on evidence." Job roles increasingly value comprehensive abilities such as policy identification and argumentation, improvement of public service processes, data literacy and information literacy, cross-departmental collaboration and public communication, risk identification and emergency response, and compliance and ethical assessment. These abilities are demonstrated through a process of "collecting evidence—weighing pros and cons—collaborating and promoting—summarizing and improving" within real-world work scenarios.

The training points in current experimental teaching often deviate from this, overemphasizing "writing like a model," i.e., whether the report format is standardized and the concepts are complete, while neglecting "doing it right," i.e., the quality of evidence, awareness of constraints, and collaborative process; emphasizing "tool demonstrations" while ignoring the explanatory chain of "data to decision"; valuing "classroom performance" while neglecting the integration of "continuously updated" abilities. Its research value lies in forming a feasible "job competency - training points - evaluation evidence" relationship, prompting reform to transform from a slogan into an alignable, measurable, and transferable curriculum transformation logic, thereby providing a clear reference standard for subsequent discussions of results.

1.3 Problem Attribution and Reform Constraints (Faculty/Platform/Resources/Class Hours/Management)

The misalignment is rooted not only in teaching philosophies but also in the joint effect of operational mechanisms and resource structures. In terms of faculty, teachers of public administration tend to be particularly good at the normative analysis and theoretical exposition, however, in other areas like developing a scenario script, planning data tasks, organizing the classroom in collaboration, and conducting a formative assessment, they would need to have more applied abilities and interdisciplinary assistance. Without the support of teaching assistant teams and research collaboration groups, experimental courses may revert to the low-risk model of "presenting cases and submitting assignments." From a platform and resource perspective, smart education platforms can provide process recording functions and execute resource allocation, but creating a high-quality case library, pedagogically usable datasets, and script libraries requires significant financial investment and involves issues such as data authorization and privacy

boundaries, leading to situations where "real tasks are desired but materials are lacking."

2. Reform Design: Turn Experimental Classes into a Workable Task Chain

2.1 Goal Restructuring: From "Case Studies" to "Decision Making and Collaboration"

The key to goal restructuring is to transform the course objective from "understanding public operation concepts and case conclusions" to "achieving governance tasks and providing explanatory decisions under limited conditions." The specific approach is to use job competency as a guide, breaking down abilities such as policy analysis, evidence integration, alternative weighing, collaborative promotion, and public expression into visible classroom behaviors and deliverables, and clarifying the specific form of evidence corresponding to each ability (such as the quality of evidence cards, the logic of comparing alternative solutions, records of collaborative processes, and review and reflection).

In terms of teaching organization, the classroom no longer revolves around teacher lecturing, but rather follows a task-based process of "problem-driven learning – evidence-driven learning – collaboration-driven learning." Teachers give the context and assessment criteria and students carry out the tasks given to them based on their assigned role, which is information gathering, constraint identification, solution development and statement of decisions. The assessment approach has also changed whereby a report was submitted at the end of the semester with no assessment being done throughout the process but the new approach takes into account the evidence-based assessment during the whole process. It guarantees that the idea of doing it correctly, explaining it in clear terms, and working together will be central to the teaching objectives, not just an empty ritual.

2.2 Content Reorganization: Four-Segment Task Chain (Basic—Comprehensive—Contextual—Collaborative)

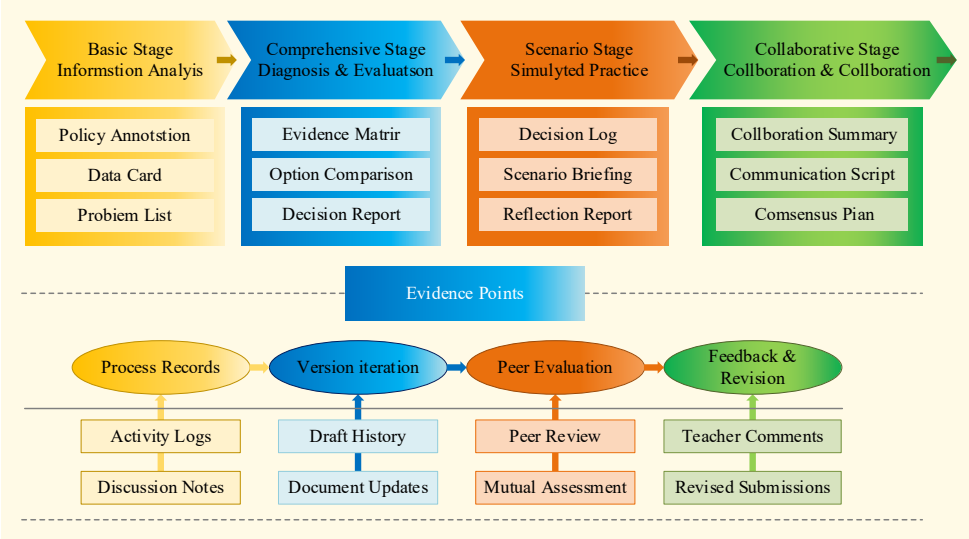

Figure 1. Schematic diagram of the task chain and each output/evidence point.

The content has been resorted to a four-step task chain so that the skills training would be progressive and cumulative. Foundational stage centers on the aspect of reading and application, which involves training students in the process of identifying information, recognizing indicators, and defining problems using policy texts and open data. Its outputs are mostly policy annotations, data cards, and problem lists, thereby establishing a traceable starting point. The detailed stage centers on the aspect of judging and measuring where students need to incorporate appropriate evidence into the judgment framework, suggest various alternative solutions, and perform comparative analysis under certain conditions. Its outputs are evidence matrices, solution comparison tables, and decision reports. The complexity of the classroom scenario-based stage involves the use of tabletop exercises, virtual simulations, the limitation of resources, and the enabling of multi-stakeholder interaction to apply pressure due to time constraints. It focuses on

documenting the process of decision-making with deliverables such as decision logs, scenario summaries, and debriefing reports. Collaboration stage further enhances cross-group cooperation and communication with the population, and it entails the development of collaboration minutes, a communication script, and a consistent plan. Evaluation takes into account both outcomes and the signs of collaboration. Figure 1 depicts four tasks, the respective deliverables, and evidence points (process records, version updates, peer reviews, etc.) that can help ensure that the execution and evaluation align in the following stages.

2.3 Smart Education Support: Platform Functions and Teaching Organization (Pre-class/ In-class/Post-class)

Intelligent education is not only about going to the platform but allowing the platform to act as a storage of evidence and as a feedback mechanism. Prior to the class, the emphasis is made on diagnosis and direction; the platform delivers contextual materials and data sets, performs pre-test and captures baseline capacities. The templated task descriptions decrease the learning curve of students. On class, the main focus is the collaboration and documentation of the process. The platform offers the functionality of groups, role-based access control, tracking of processes, and version control services that are aimed at having students submit evidence cards, update solutions, and describe their choices under the same workflow. The teachers would subsequently be able to assess major milestones and correct deviations on the spot, thus avoiding one central grading at the end of the course. The goal after class is feedback and improvement.

3. Classroom Implementation: How to Implement Pilot Courses

As shown in Figure 2, this pilot course uses a "four-stage task chain" as the main thread, organizing experimental teaching into a feasible governance task process. Classroom learning no longer relies on case studies to conclude the learning cycle, but rather on the continuous generation of "evidence-decision-collaboration-review" to drive the learning process. The course creates a unified task workflow on the platform: each task includes a scenario package (containing policy text, open data, event constraints, role responsibilities, and submission templates), and version management and timestamps are applied to submissions to ensure traceability of the learning process. The pre-class phase uses the platform to achieve baseline judgment and scenario calibration: students must submit policy annotations and data cards (the basic part) within a specified time; the platform records the completion rate, time taken, and the time of the first submission. Based on the judgment results, teachers make minor adjustments to the difficulty of the materials and the pace of the class, ensuring that class time focuses on "evidence integration and decision deduction" rather than restating the background situation.

The classroom activities use role-based division and evidence-based discussions. All groups are given the same context, but various roles are given to each group (e.g. as the competent authority, as the implementing department, as the third-party evaluator, as media, or as a representative of the population). The discussions are held through evidence matrices and comparison tables (the part of the comprehensive component) and a decision-making log is kept throughout the simulation tasks (the part of the contextual component). The course requires that to ensure that cooperation does not just remain words, process evidence should be submitted as an obligatory form: discussion minutes, decision logs, version difference records, and peer review forms. The evidence should be connected to the final decision report, and all its inferences are related to the corresponding evidence items and constraints. The teacher's role in the classroom is limited to three verifiable actions: first, questioning the sufficiency of evidence, i.e., requesting the completion of data sources or policy justifications. The second approach is to provide structured feedback on the trade-offs between solutions. This also requires adding alternative solutions and constraints. The third approach is to intervene in the implementation process of the collaboration to address issues such as missing roles, uneven contributions, and discussions deviating from the topic. In the post-class process, secondary revision is considered a necessary step. Teacher feedback will be displayed on the platform according to the scale dimensions. Students must complete the revision within the specified time

and submit a "revision explanation." The platform will also retain the initial and final drafts to provide support for version update statistics in subsequent evaluations.

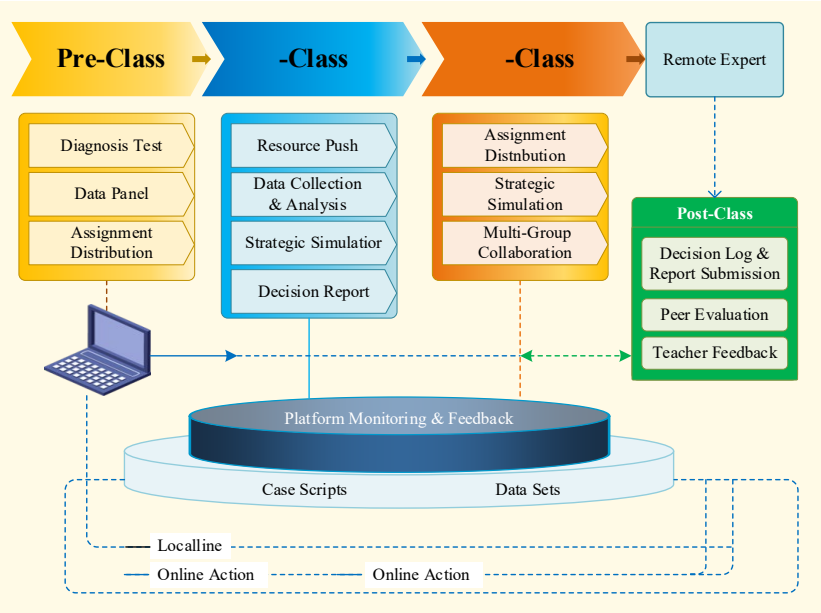

Figure 2. Process framework for experimental teaching reform in public administration under smart education.

4. Evaluation and Discussion of Results: Using Evidence to Demonstrate the Effectiveness of the Reforms

Table 1. Comparison of evidence indicators for task chain process (before and after reform).

Indicator	Unit	Before Reform	After Reform
Pre-class diagnostic completion rate	% of students	68.7	91.4
Median time to first submission	hours	36.2	18.9
Evidence cards submitted	total count	124	356
Evidence citation density	citations / 1,000 words	4.3	8.1
Median version iterations per team	count	1.2	3.6
Decision log coverage	% of required checkpoints	41.8	86.5
Peer-review participation rate	% of students	52.3	88.9
Median feedback turnaround time	hours	72.4	28.6
Resubmission rate after feedback	% of teams	18.7	79.6

Data source: A compilation of logs from a school's teaching platform, homework submission records, decision log templates, and teacher feedback records.

This study evaluates the effectiveness of smart education in supporting the reform of experimental teaching in public operations, following the evaluation logic of "recordable process, closed-loop feedback, and interpretable results." Table 1 shows that after the reform, the learning process exhibited verifiable changes at key nodes. The completion rate of pre-class diagnosis improved from 68.7% to 91.4%, and the median time for the first submission decreased from 36.2 hours to 18.9 hours, indicating that pre-task preparation and structured guidance enhanced the efficiency of learning initiation. The number of evidence cards submitted and the density of evidence citations both increased, and the coverage of decision logs expanded from 41.8% to 86.5%, indicating that students created a more complete "evidence-reasoning-decision" path in situational tasks. This better reflects the mechanism change in the closed loop of formative assessment, with the median number of version updates increasing from 1.2 to 3.6, the feedback waiting time

decreasing from 72.4 hours to 28.6 hours, and the proportion of resubmission after feedback improving from 18.7% to 79.6%. This demonstrates that the "submission-feedback-" path is more effective in establishing a closed loop in the learning process. "Revision" has become a routine procedure for the course.

5. Conclusion

This paper focuses on whether experimental teaching in public operations can generate transferable skills. It proposes an intelligent transformation approach: organizing learning through task chains, constraining processes through evidence chains, and driving improvement through feedback chains. Data from pilot courses is used to verify the actual operation of this cyclical mechanism. The contribution of this research lies in transforming the improvement of experimental teaching from empirical suggestions into an executable workflow: clearly defining outputs, evidence points, and evaluation criteria, thus making the "evidence-reasoning-decision-collaboration" process recordable and evaluable, thereby transforming it into a learning process. For widespread application, curriculum reform should first establish fixed scripts, templates, and scales, form a relatively stable assistant team with platform support, and collect case studies and data within a legal and compliant framework. This study has limitations in sample scope and scenario types. Future research could involve cross-class, cross-school, and long-term follow-up studies to further explore the suitability of task chains and their learning transfer effects under different governance themes.

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