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Research on Curriculum Design Integrating Self-Directed Project-based Teaching

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Abstract: In the new era, under the reform of higher education emphasizing the cultivation of autonomous and innovative talents, traditional project-based teaching generally suffers from practical problems such as students passively completing tasks, lacking self-control, and insufficient intrinsic motivation for learning. Self-leadership theory centers on behavioral focus, natural rewards, and constructive thinking as core strategies, emphasizing individual autonomous planning, self-motivation, and cognitive optimization, providing a new theoretical perspective for reconstructing project-based teaching logic. This paper takes professional course teaching in higher education institutions as its research object, bases itself on classic theories of self-leadership, analyzes the existing pain points of project-based teaching, and systematically builds a project-based curriculum framework integrating self-leadership from three major modules: pre-class goal framework, in-class project implementation, and closed-loop post-class evaluation. It refines key teaching design points for each stage and proposes optimization paths focusing on ensuring teaching implementation, supporting course resources, and cultivating teacher abilities. The research aims to improve the theoretical system of project-based teaching, provide practical design ideas for university curriculum reform, and help cultivate new-generation university students with qualities of autonomous learning and self-development.

Keywords: Self-leadership; Project-based teaching; Course design; Higher education; Teaching reform.

1. Introduction

With the continuous deepening of new liberal arts and engineering disciplines, the focus of higher education talent cultivation has shifted from knowledge implantation to the collaborative cultivation of comprehensive abilities and intrinsic qualities. Independent planning, problem-solving, and self-motivation have become essential core competencies for university students. Project-based teaching relies on real tasks and group collaboration to carry out instruction. It has now been widely applied in various professional courses such as economics and management, engineering, and education, but long-term practice has gradually revealed inherent shortcomings: most project topics are assigned by teachers, task nodes are defined by teachers, and students become the executors of tasks, lacking autonomy in decision-making; When project progress encounters setbacks, students tend to develop a fear of difficulty and a passive attitude, relying on teacher guidance and lacking the ability to adjust independently; Course assessment focuses on final project outcomes and neglects self-growth during the learning process (Knotts et al., 2022). The root of these problems lies in the lack of theoretical support for individual self-management in existing project-based teaching designs, making it difficult to fully stimulate students' intrinsic learning motivation.

Self-leadership theory originated in the field of organizational behavior and, after decades of development, has gradually extended into the field of education. It advocates that individuals achieve self-control through goal setting, self-supervision, intrinsic motivation, and cognitive restructuring, effectively improving issues such as passive learning and academic procrastination (Neck & Houghton, 2006). Empirical studies both domestically and internationally have confirmed that systematic self-leadership interventions can enhance students' academic engagement, innovative thinking, and problem-solving abilities. However, most research focuses on short-term training experiments, with few theoretical discussions and design studies that systematically embed self-leadership into a complete project-based curriculum system.

Based on the above gaps in reality and theory, this paper adopts a method of literature review and theoretical deduction to sort out the internal logic of self-leadership and project-based teaching, and to construct a targeted integrated course design plan. On the theoretical level, enrich research on the application of self-leadership in higher classroom teaching, expanding the theoretical connotations of project-based teaching; On the practical level, it provides standardized and practical course design references for frontline university teachers, promoting the classroom's transformation from "task-driven" to "self-driven."

2. Analysis of Relevance Between Related Concepts and Theories

2.1. Core Concept Definition

First, self-leadership. According to the classic classification by Houghton & Neck (2002), the self includes three core strategies: first, behavior-focused strategies, covering self-goal setting, self-observation, self-feedback, and self-reward and punishment, emphasizing regulating individual actions from a behavioral perspective; Second, natural reward strategies, relying on interest and a sense of achievement to achieve intrinsic motivation, distinguishing them from external material rewards and punishments; Third, constructive thinking strategies, which engage in positive self-dialogue and correct irrational cognition, breaking negative thoughts such as fear of difficulty and self-denial. These three complement each other to form the complete logic of individual autonomous development.

Second, project-based teaching. Project-based teaching

uses real industry or subject issues as project carriers. Students work in groups to conduct research, design solutions, and implement results throughout the entire project process. Its core advantage is the integration of theoretical knowledge with practice, but traditional design logic is mainly teacher control, weakening student agency.

2.2. Inherently aligned with logic

From the perspective of educational goals, project-based teaching aims to cultivate students' practical abilities, while self-leadership focuses on developing individual autonomy. Both ultimately focus on cultivating high-quality, application-oriented talents, with highly unified educational goals. From the implementation process perspective, the entire project cycle includes topic planning, process advancement, problem rectification, and results review, which corresponds to the three major self-leadership strategy scenarios: the topic selection stage adapts to self-goal setting, the project promotion phase involves self-observation and internal motivation, and the project setbacks carry out cognitive restructuring, naturally meeting the conditions for integration.

From the perspective of complementary existing shortcomings, traditional project-based models lack intrinsic motivation mechanisms, and self-led natural reward strategies can fill the gaps in motivation; In the project, students lack self-control ability, and behavior-focused strategies can regulate individual learning behaviors; Students tend to give up passively when facing project failures, and constructive thinking can optimize cognitive patterns (Mao et al., 2024). The integration of the two can complement each other's strengths and optimize the existing teaching system.

2.3. Review of Existing Research Limitations

Reviewing existing literature, the SLP self-directed programs designed by Phillips et al. (2017) abroad mostly consist of short-term extracurricular activities and are not embedded in regular professional courses; Existing domestic teaching reform research mostly focuses on renovating small classroom segments, lacking systematic design discussions covering the entire semester. This is also the entry point of this study.

3. Integrate Self-oriented Project-based Course Architecture Design

Based on the three major strategies of self-leadership, following the entire teaching cycle of pre-class—in-class—post-class, it builds an integrated project-based curriculum system of "three steps and six stages," designed with a regular 16-week university professional course cycle, and refines content by module. From the perspective of top-level course logic, this framework breaks away from the traditional project-based teaching approach of focusing only on knowledge implementation and task delivery. It embeds three types of self-leadership strategies—behavior-focused, natural rewards, and constructive thinking—into every node of the project process, achieving the simultaneous advancement of professional knowledge instruction with student self-management, intrinsic motivation, and cognitive optimization. It adapts to the project-based teaching needs of economics, management, engineering, humanities and social sciences, and balances theoretical learning, practical ability, and personal qualities for collaborative development.

3.1. Pre-class Preparation Stage: Behavior-Focused Strategies, Independently Anchoring Project Goals (First Stage)

Traditional project-based teaching involves teachers setting topics and dividing tasks, with students passively accepting arrangements. The entire project's development direction and stage rhythm are controlled by the teacher, leaving students with little space for independent thinking and overall planning. They are often in a passive learning state, prone to relying on group members, procrastinating, and habitually waiting for teacher guidance when facing difficulties. After integrating self-leadership, the core of this segment is to implement behavioral strategies for setting and planning self-goals, returning the initiative to students.

First, in the first week of the course, a self-leadership general micro-lecture was added. The teacher spent 1-2 class hours explaining the basic concepts of three major strategies, and, drawing on past project cases, explained how to break down long-term goals and break down phased small tasks, breaking the students' fixed "waiting for assignments" mentality. During teaching, teachers explain the connection between project tasks and key and difficult points in the curriculum according to the curriculum objectives of their major, helping students understand the practical value of project-based learning and shift from a passive learning mindset. Second, the teacher-defined topic model has been abolished. Each group conducts independent research based on course knowledge points and industry hot topics, extracting project topics from real-world scenarios. Students can use various methods such as online industry news, offline field visits, and literature review to gather materials, focusing on real social needs to explore research directions and avoid topics that are detached from reality or hollow. After topic selection, the group divides responsibilities internally. Each member creates a personal task list and short-term learning goals based on their strengths, forming a written personal goal ledger. The ledger details the task content, completion deadlines, and self-inspection standards for each stage, ensuring that individual tasks correspond to the overall project progress of the group. Finally, teachers only answer questions and correct the feasibility of the topic and the rationality of the goals, without directly modifying students' plans, preserving space for students' autonomous decision-making and implementing the pre-design of self-led behavior from the source. Even when shortcomings are found in the topic selection, teachers guide students to independently optimize and adjust through heuristic questions, helping them develop judgment skills during the process of revising the plan.

3.2. Project Implementation Stage in Class: Natural Rewards + Constructive Thinking Two-Way Implementation (Stages 2, 3, and 4)

This stage is the core implementation phase of the course, spanning weeks 2 to 13. It integrates three types of strategies: self-observation, intrinsic motivation, and cognitive correction, and is divided into three classroom activities. This cycle spans key processes such as project research, plan refinement, and content implementation. It is also a stage when various student problems explode intensively. By designing classroom activities at different levels, students are gradually cultivated in self-control abilities.

First, regular self-review (behavioral focus, self-observation). A regular half-class internal review meeting is set up every week, where members check their progress against previously established personal task ledgers, record reasons for incompleteness and existing difficulties, and create weekly self-review notes. The review is not limited to task completion data statistics; students need to objectively sort out various practical issues such as unreasonable time allocation, research method errors, and poor communication and coordination. Groups will jointly discuss next week's rectification measures around these problems. Teachers do not intervene in internal group conflicts or task assignments, only providing directional suggestions when the group as a whole stagnates, forcing students to develop self-supervision habits. Long-term weekly reviews help students develop the habit of regular self-checks, gradually improve bad learning habits such as procrastination and perfunctory learning, and integrate self-observation into daily study.

Second, diversify outcome selection (natural reward strategy). Breaking the single requirement for unified project reports, various output formats such as research reports, business plans, course short videos, and physical prototypes are offered. Groups can independently choose the form of outcomes based on members' interests. Different forms of achievements correspond to the same assessment criteria, and there is no score bias due to differences in production difficulty. Students can create based on their areas of expertise, relying on the intrinsic sense of achievement brought by interest to achieve natural rewards, abandoning external incentives based solely on regular and final scores, and continuously maintaining learning initiative internally. Compared to rigid and uniform outcome requirements, a flexible output model can fully mobilize the enthusiasm of students with different characteristics, allowing those skilled in copywriting, hands-on practice, and new media creation to leverage their strengths.

Third, Discussion on Frustration Cognition (Constructive Thinking Strategies). Project research and solution design are prone to errors in thinking and missing data. At key points in project advancement, whenever a solution is hindered, special seminar classes are set up at appropriate times to guide students to abandon the negative perception that "poor project performance means lack of ability," engage in positive self-dialogue, identify problems from objective perspectives such as resources, methods, and division of labor, reconstruct problem-solving thinking, and use cognitive optimization to drive project iterative optimization. Seminars are not limited to current project issues; students can draw inferences, organize methods to avoid similar mistakes, accumulate experience in handling project setbacks, gradually break free from self-denial mindsets when encountering difficulties, and establish a rational cognitive pattern of viewing mistakes.

3.3. Post-class Assessment and Summary Stage: Closed-loop reflection to consolidate self-leadership qualities (Steps 5 and 6)

The final three weeks of the course serve as a final review phase, relying on self-feedback and self-summary to improve the closed-loop design, changing the traditional "one exam to determine scores, results only" assessment model, incorporating process performance into the core scoring category, truly achieving assessment-oriented guidance for daily self-directed learning.

First, reconstruct a diversified assessment system. The total score consists of three components: individual phased review records (40%), group final project results (40%), and classroom autonomy (20%). This increases the weight of process-based evaluation and guides students to value daily self-management. Among these, classroom autonomy is refined into multiple observation indicators such as proactive task adjustment, group collaboration, and classroom discussion speeches, with detailed scoring rules and a reduction in teachers' subjective scoring. Assessment no longer focuses solely on project strengths and weaknesses, but also considers students' personal growth and changes throughout the process. Even if the final project results have flaws, students can still earn corresponding scores by carefully planning and continuously optimizing throughout the process, preventing students from neglecting growth in pursuit of high scores.

Second, a full-cycle growth summary. After the course, each student is required to write a personal growth report, reviewing the entire process of achieving their goals, handling problems, and changing cognition throughout the project cycle, summarizing experiences and shortcomings in using self-leadership strategies, completing self-feedback, and achieving a closed teaching loop. Growth reports are not bound by fixed formats; students can write truthfully based on their own real learning experiences. Outstanding reports can be shared and exchanged within the class. Through peer experience exchange, all students further deepen their understanding of self-leadership and practical methods.

3.4. Design of Supporting Classroom Details

Beyond regular class hours, an autonomous Q&A community is built based on the online learning platform, allowing students to record their learning insights and adjust goals at any time. Teachers regularly summarize common questions for collective Q&A, extending scenarios for self-leadership cultivation outside the classroom and connecting the cultivation chain inside and outside the classroom. The online community is open around the clock, allowing students to leave messages and communicate when encountering project challenges during breaks or holidays. In addition to teacher Q&A, students are encouraged to exchange experiences within the community, fostering a supportive learning atmosphere. At the same time, with the platform's check-in feature, students are guided to regularly record the completion of phased goals, extending self-supervision from classroom to fragmented time outside of class, filling the cultivation gap caused by limited class hours.

4. Optimization Paths for Ensuring Course Implementation and Implementation

Project-based teaching implementation integrating self-leadership cannot rely solely on curriculum plans; it also requires building a supporting support system from three dimensions: teacher quality, course resources, and tiered teaching design, comprehensively eliminating obstacles to course implementation and ensuring smooth implementation of the structural design.

4.1. Strengthen teachers' self-leadership and related teaching and research abilities

Teachers are the key to implementing instructional design.

Colleges and universities should regularly conduct specialized teaching and research training, covering self-leadership theory, project-related integration methods, and techniques for guiding students' negative cognition. The training combines theoretical study + classroom practical seminars, organizing teachers of the same course to conduct collective lesson preparation, focusing on topics before class, review during class, and post-class assessment to discuss practical challenges. Teachers are encouraged to participate in self-led teaching reform projects, accumulating and optimizing classroom practical experience through teaching research, and avoiding teaching designs that become mere formalities due to insufficient theoretical understanding. Schools can also organize cross-disciplinary teaching and research exchanges, with teachers from different subjects sharing practical experiences in self-directed project teaching, learning from each other's strengths to enrich teaching ideas.

4.2. Layered Flexible Design to Adapt to Different Learning Situations

There are significant differences in students' foundation, self-discipline level, and study habits upon enrollment. Some students have long lacked independent planning and training, making it difficult to quickly adapt to fully autonomous project models. Flexible curriculum setting mechanism allows students with weaker foundations to simplify phased task goals and prioritize basic self-planning; Students with strong independent abilities can expand the scope of project research and independently add research content. At the beginning of the course, a simple assessment of students' learning status was conducted to grasp the overall ability distribution of the class. When grouping, a combination of strong and weak students was used, and group collaboration was used to help each other. Students with outstanding abilities helped those with weaker foundations gradually adapt to the pace of independent projects. The tiered design takes into account differences in learning conditions, avoiding overly high goals that could discourage students, aligning with the intrinsic motivational logic of natural rewards, so that students at all levels can gain a sense of achievement through completing tasks.

4.3. Improve the supporting practical resources both inside and outside the university

Project-based teaching relies on real-world scenarios, with departments and industry enterprises and social organizations building off-campus research resource pools, providing channels for students to conduct independent research and field visits. Institutions regularly connect with local industry organizations, building practical channels for on-site visits and frontline interviews, while integrating industry reports, industry data, and other online resources to enrich the sources of student project materials. Ample external resources can reduce resistance to project implementation, lessen negative emotions caused by resource shortages, and ensure the smooth implementation of constructive thinking strategies. The resource library content is continuously updated in line with industry developments, ensuring that student research materials closely follow industry realities and enhance the practicality of project research.

4.4. Establish a dynamic iteration mechanism for courses

After each round of courses, student growth reports and classroom feedback are collected, combined with instructors' reflections, and topics guidance, assessment criteria, and project formats are optimized year by year. Self-leadership and integration details are fine-tuned according to professional characteristics, achieving regular iterative upgrades in course design. Each semester, departments summarize course operation data, identify pain points in each stage, and make targeted adjustments and optimizations in the next round of teaching to address issues such as difficulty in pre-class topic selection, in-class review efficiency, and loopholes in assessment criteria. Synchronously update project topic directions in line with industry environment changes, ensuring project content aligns with current industry developments, continuously improving the entire course framework, and promoting steady improvement in course quality.

5. Research Conclusion

Based on three core strategies of self-leadership, this paper addresses the shortcomings of traditional project-based teaching and constructs an integrated course design plan covering the entire cycle before, during, and after class. It embeds self-goal setting, self-supervision, internal motivation, and cognitive reshaping throughout the project process, achieving a transition from teacher-led teaching to student-led autonomous learning. This design is based on the intersection of pedagogy and organizational behavior, retaining the advantages of combining project-based teaching theory with practice, while leveraging self-leadership to address shortcomings in cultivating students' autonomous literacy.

From a long-term development perspective, integrating self-leadership into project-based teaching is an important reform direction for autonomous education in higher education. Subsequent frontline teachers can fine-tune design details according to their major's characteristics: science and engineering focus on self-control design for physical project implementation, while liberal arts focus on goal breakdown design for research projects. Due to its purely theoretical nature, this paper does not conduct empirical data testing. Subsequently, parallel class quasi-experiments can be used to quantitatively verify the actual educational effectiveness of this course design and further improve and optimize the plan.

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