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The Practice of PBL in the Postgraduate Course of Educational Psychology

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Abstract

With the advent of the AI era, the cultivation of talents needed by society has become increasingly prominent in the field of education. In particular, the cultivation of innovativetalents emphasizes the improvement of applied capabilities. So, in the face of the limitations of the " Educational Psychology" textbook for postgraduate students, who can be improved their research skills as well as master the application of educational psychology in educational practice in the course? This is a question worthy of exploration. Based on this, the study conducts a practical exploration of PBL in the master's course of "Educational Psychology" in order to provide references for relevant teaching reforms and practical reforms.

Keywords: PBL; Educational Psychology; Educational Management; Practical Teaching

Preface

With the advent of the AI era, the cultivation of talents needed by all walks of life has put forward new requirements for education, and the improvement of applied capabilities in the process of talent cultivation has become increasingly prominent. Therefore, graduate education, as a high-end talent cultivation model in various countries, is crucial for the emergence of the country's overall innovative talents. As early as 2014, the Ministry of Education of China put forward the requirements to strengthen curriculum construction and improve curriculum quality. The Ministry of Education, the National Development and Reform Commission, and the Ministry of Finance also jointly issued a document: to improve the cultivation model of academic degree postgraduate students with the goal of enhancing innovation capabilities. Make overall arrangements for the master's and doctoral training stages, promote the harmonious blending of curriculum learning and scientific research, strengthen the cultivation of innovation capabilities, and explore and form cultivation models with different characteristics. Ministry of Education of the People's Republic of China, National Development and Reform Commission, & Ministry of Finance (2013) Attach importance to providing systematic scientific research training for postgraduate students, require and support postgraduate students to participate more in cutting-edge and high-level scientific research work, and support high-level postgraduate cultivation with high-level scientific research. In 2020, the three ministries and commissions jointly issued another document on graduate education, proposing to focus on core elements such as the effectiveness of talent cultivation, the quality of scientific research and innovation, and the contribution to social services, and improve the classified and multi-dimensional quality evaluation system (Ministry of Education of the People's Republic of China, National Development and Reform Commission, & Ministry of Finance 2020). It can be seen that the current reform of graduate education should, on the basis of curriculum construction, select teaching methods that are conducive to the in-depth participation of postgraduate students in scientific research activities and the improvement of their core quality capabilities. The course "Educational Psychology" is a core component for postgraduate students majoring in educational management and

educational psychology. How can they be helped to not only improve their scientific research skill but also master the application of educational psychology in educational practice (such as teaching design, classroom management, and student evaluation) in this course? This is a very worthy issue to be explored in the current process of educational reform.

The Importance of Educational Psychology in the New Era

With the revolutionary changes in knowledge acquisition methods and the intensification of global competition, the goal of education in the new era has shifted from traditional "knowledge transmission" to "cultivation of core competencies." In this profound transformation, educational psychology is no longer merely a chapter in teacher training courses, but a "soul navigation" that runs through educational innovation and practice, and its importance is increasingly prominent.

(1) Core Engine for Scientific "Teaching Students in Accordance with Their Aptitude"In the era of information explosion, students vary greatly in cognitive styles, interest inclination and learning pace. With its profound accumulation of theories on learning mechanisms, memory laws and motivation, educational psychology provides theoretical basis and practical tools for constructing personalized learning paths.

(2) Ballast Stone for Building a Healthy Educational Ecosystem Students in the new era are facing unprecedented academic pressure, social complexity and identity challenges. Educational psychology is the key for teachers to understand the emotions and needs behind students' behaviors. It guides us to create classroom environments with psychological safety, and to cultivate students' growth mindset, resilience and empathy.

(3) Baton for the Effective Integration of Educational Technology Faced with emerging technologies such as AI, big data and virtual reality, we urgently need to answer the question of "how to use" rather than "how to create." Educational psychology plays a role of judgment and guidance here. It helps us identify which technological products truly conform to cognitive laws and can promote learners' in-depth thinking.

The limitations of the textbook

Textbooks for master's students in educational psychology play an important role in teaching, but there are also some limitations. These limitations directly affect students' learning outcomes and the practical value of the courses.

(1) Overemphasis on theory and insufficient practice. Many textbooks focus too much on theoretical elaboration and lack real-life cases and practical guidance. During the learning process, students passively listen to lectures and find it difficult to apply theoretical knowledge to actual educational problems, resulting in a disconnection between theory and practice. Postgraduate students are in great need of content on practical exercises and field research.

(2) Content update lags behind and fails to meet the needs of the times. The content of textbooks may not be able to reflect the latest research findings and development trends in the field of educational psychology in a timely manner. The knowledge that students are exposed to, especially teaching methods, cannot meet the requirements of modern education.

(3) The cultural background is single, and there is a shortage of local cultural cases. Many teaching materials are mainly based on Western cultural backgrounds and lack discussions on educational psychology issues in the context of local culture. In the current era of multi-cultural integration, students may feel uncomfortable in the cross-cultural educational environment and find it difficult to solve educational problems under the background of diverse cultures.

(4) There is a lack of interdisciplinary integration. The content of teaching materials may be limited to the field of educational psychology and lacks integration with other disciplines such as neuroscience, sociology, management science, and information technology. It is difficult for students to understand and solve complex educational problems from a multi-disciplinary perspective.
(5) There is a lack of interactivity and participation. Traditional teaching materials mainly focus on one-way knowledge transfer and lack interactivity and participation. Traditional teaching methods mainly rely on lectures and also lack interactivity and participation. Therefore, students' learning interest and initiative will be restricted.
(6) The evaluation methods are single, and the evaluation subjects are not diverse enough. Teaching materials may lack diverse evaluation methods and rely too much on traditional examinations. The grades are difficult to reflect students' real participation in classroom teaching and their mastery of knowledge. Students' comprehensive abilities (such as practical ability and innovation ability) may not be fully evaluated and developed.
(7) There is a lack of an international perspective. Teaching materials may lack attention to international educational psychology research and practice, which may limit students' international vision and cross-cultural abilities. In the trend of global integration, students need to understand global educational problems and enhance their international perspective.
(8) There is insufficient integration of technology. Teaching materials may not make full use of modern technologies (such as artificial intelligence and big data analysis) to support teaching and research. Contemporary postgraduate students may lack the understanding and application ability of emerging technologies. The teaching content should enhance the modernity and practicality of teaching.
In general, the limitations of textbooks for master's students in educational psychology are manifested in many aspects, such as the disconnection between theory and practice and the lack of interdisciplinary integration. In the face of this core issue, if we want to cultivate postgraduate students in the new era who can not only improve their scientific research capabilities but also master the application of educational psychology in educational practice, it is necessary to reform teaching methods! Teachers need to break the limitations of textbooks during the teaching process, with the ultimate goal of enhancing students' scientific research capabilities and the practical application of educational psychology in education and teaching.

Design of Project-Based Teaching

1.1 Connotation of PBL Method

Jie (2024) found that the project-based learning method(PBL), also known as project-based teaching, is a student-centered teaching method that emphasizes promoting students' in-depth learning and ability development through the completion of real and complex projects.

1.1.1 The Origin and Application of PBL

Project-based teaching originated in medical education in the 1950s (Wang et.al.2013). This teaching model was initially proposed by the integrated curriculum education of the School of Medicine at Western Reserve University in the United States. Barrows at McMaster University in Canada, marking the official application of PBL in higher education (Barrows & Tamblyn, 1980). After PBL was introduced into medical education, its unique teaching model and remarkable teaching effects gradually attracted the attention of the educational community. Subsequently, PBL gradually expanded to multiple fields such as education schools, business schools, and engineering schools. In the late 20th century, as an innovative teaching model, PBL became rapidly popular internationally. Boud,and Feletti (2013) support that more and more countries and

regions began to attempt to introduce PBL into their respective education systems to promote educational reform and innovation. In recent years, PBL has been widely applied worldwide, including higher education, secondary schools, and primary schools etc.. Modern teaching technologies such as web quests and social media, which are web2.0 teaching tools, are being deeply integrated into PBL classrooms, providing students with a more diverse range of learning resources and more convenient and efficient learning methods (Wang et. al, 2017). Practice has proved that project—based teaching system based on constructivism plays a great role in promoting students' ability of analyzing and solving problems, in the spirit of solidarity and collaboration, and in the training ability of engineering practice and innovation (Chen et. al, 2018)

1.1.2 The Core of PBL

(1) Student-centered. Students play an active role in the project, while teachers act as guides and supporters. Students independently choose research questions, design solutions, and implement the project.
(2) Real-world context. The project is based on real-world problems or challenges and has practical significance. Students apply knowledge in real situations, enhancing the practicality and interest of learning.
(3) Interdisciplinary integration. Projects usually involve the comprehensive application of knowledge from multiple disciplines, helping students establish connections between different knowledge areas.
(4) Cooperative learning. Students complete the project through group cooperation, cultivating teamwork and communication skills. During the cooperation process, students learn to divide tasks, resolve conflicts, and make joint decisions.
(5) Process-oriented. The project-based teaching method focuses on the learning process rather than just the final outcome. Students go through stages such as problem definition, information collection, solution design, implementation, and reflection in the project.
(6) Reflection and evaluation. Students summarize learning experiences through reflection, improving their metacognitive abilities. The process evaluation methods are diverse, including self-evaluation, peer evaluation, and teacher evaluation, which can promote students' social development.

1.1.3 Advantages of PBL

Firstly, by solving real problems, students can deeply understand the connotations and applications of knowledge, thus promoting deep learning. Secondly, the PBL method helps cultivate students' comprehensive abilities such as critical thinking, problem-solving skills, cooperation ability and innovation ability. Thirdly, real-life situations and independent exploration can stimulate students' learning interests and internal motivation, enhancing their learning motivation. Fourthly, students apply knowledge in projects, which can enhance their practical skills and professional qualities and improve their practical abilities (Jie, 2024).

1.1.4 Three Challenges for Teachers of PBL

The teachers practicing PBL need to face three challenges:
Challenge 1: Time and Resource Requirements
PBL method requires a significant amount of time and resource support. Teachers must rationally design the scale of the project and integrate resources both inside and outside the university.
Challenge 2: The Transformation of Teachers' Roles
Teachers need to transform from knowledge transmitters to guides for students' ability improvement and supporters of the project. Teachers are required to enhance their capabilities in project design and guidance.

Challenge 3: Coping with Students' Individual Differences
Students may choose different projects or show significant differences in their performance during the project. Teachers need to have a wide range of knowledge, patience, and strong psychological qualities to provide personalized support to students.

2.1 The Class Instructional Design Based on PBL

PBL is a student-centered teaching approach that uses projects as carriers. Through students' teamwork, autonomous learning, and practical exploration, it aims to cultivate students' comprehensive abilities and problem-solving skills. Based on this, the focus has shifted from the teacher "lecturing" to the students "doing" in this course. The classroom has been transformed into project teams or "start-up" teams.

2.1.1 Design Concept

The core objectives of the "Educational Psychology" course for postgraduate students are to enhance scientific research capabilities and the application of educational psychology in classroom design. This course is worth 3 credits and consists of 45 class hours, with a total of 13 students. (See Table 1 and Figure 1)

Table 1: Basic Information of Students

Number	Gender		Average age	Experienced individuals	Education related	Others
	M	F				
13	6	7	28	6	2	5

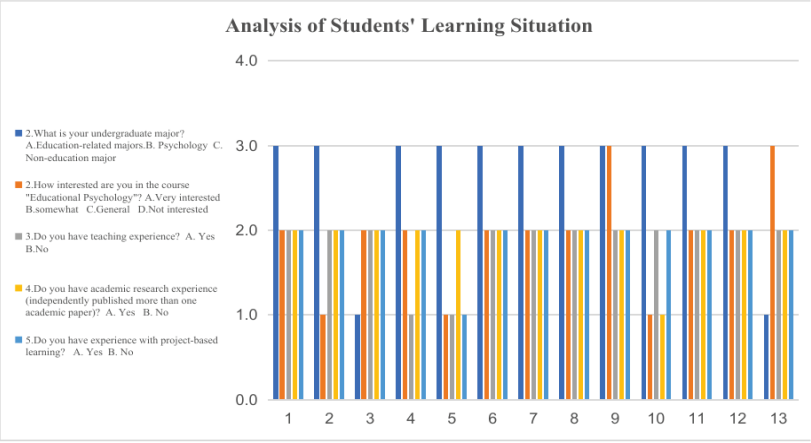


Figure 1: Analysis of Students' Learning Situation

Establish a learning resource library for Educational Psychology for students according to the actual situation of this class. The library includes e-textbooks, relevant literature, and relevant tool forms and templates required by the course, providing a "scaffold" for students with non-related majors. Also, design course learning tasks and student task lists. (See Figure 2)

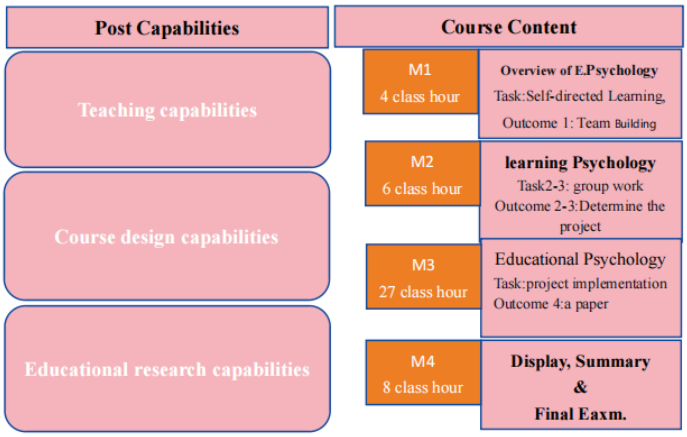


Figure 2 Learning Content Design

Each module corresponds to tasks and project practices. For example, in the first lesson, students are required to freely form teams, which includes designing team culture, team slogans, team logos, and team management structures, and then create a PPT to share their reports. This task cultivates comprehensive abilities such as communication skills, innovation skills, writing skills, collaboration skills, and leadership, ultimately promoting the enhancement of professional qualities.

The project tasks are divided into two parts: a research paper and a course design. The first project is completed in 36 class hours, while the second project is completed in 6 class hours. The specific topics of the projects are determined through discussions within the group teams. At each stage, the teacher provides scaffolding, support, and guidance for the students. Each stage runs through with learning, applying, doing, writing, and reflecting, supporting the holistic development of students.

Each module aligns with tasks and project practices. For example, the first lesson requires students to freely form teams, which includes designing team culture, team slogans, team logos, and team management structures, and then creating a PPT to present their work. This task fosters comprehensive skills such as communication, innovation, writing, collaboration, and leadership, ultimately enhancing professional competence.

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2.1.2 Enhancing Interdisciplinary Comprehensive Skills in the Process

In this course, students are required to choose one research project to complete a paper, and the group must independently manage the entire project process. The teacher provides immediate guidance during this process but does not participate in decision-making. The completion of each project requires knowledge in psychology, education, project management, and evaluation, which goes far beyond the scope of a single discipline. Through this interdisciplinary approach, students can enhance their comprehensive professional skills. (See Figure 3)

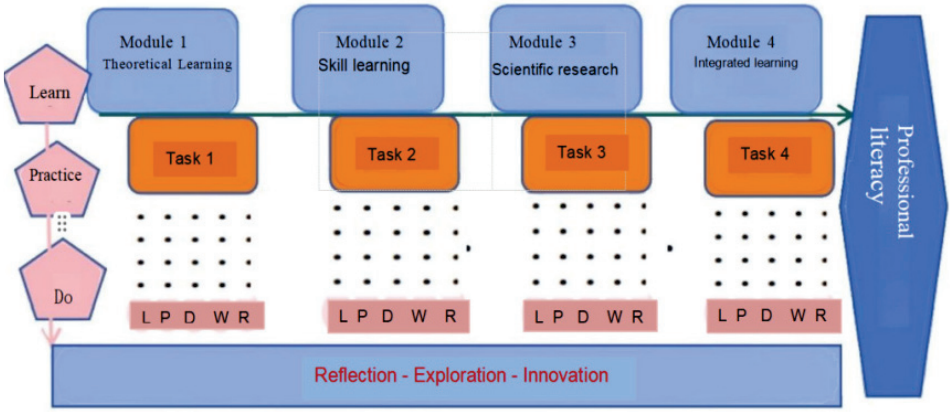


Figure3 Tasks in the process of teaching implementation

2.1.3 Establish a “process diversity” curriculum evaluation system

Processuality means that evaluation runs through the entire teaching process. A “growth record” is established for students to document their learning process, enabling concurrent learning and evaluation, promoting learning through evaluation, and synchronizing learning and evaluation. Each module mainly involves three types of evaluations: knowledge assessment (group reports, reflection sheets); evaluation of plan design and implementation (self-evaluation by groups, teacher evaluation, evaluation by teacher-student judges); and value-added evaluation (self-evaluation by students, peer evaluation, evaluation by others). In each evaluation process, all participants are involved, and different awards are selected, such as the Best Plan, the Best Reporter, the Best Collaboration Group, the Best Creativity, the Most Diligent Learner Award, etc. Students are promptly given certificates of encouragement. Good experiences will encourage students to practice repeatedly in the next tasks and project activities, and deficiencies will be promptly reflected on and improved. The evaluation process helps students enhance their evaluation capabilities, achieving the effect of promoting learning through evaluation and integrating learning and evaluation, ultimately facilitating students’ social development and improving their professional qualities. (See Figure 4-5)

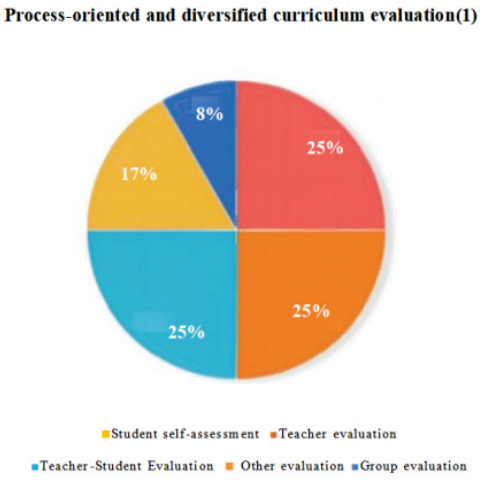


Figure 4 “Process-oriented and Diversified” Curriculum Evaluation System

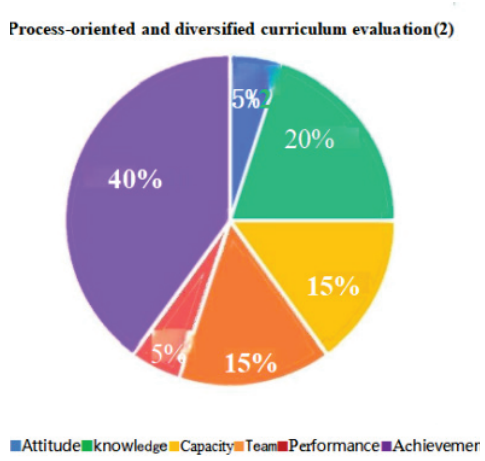


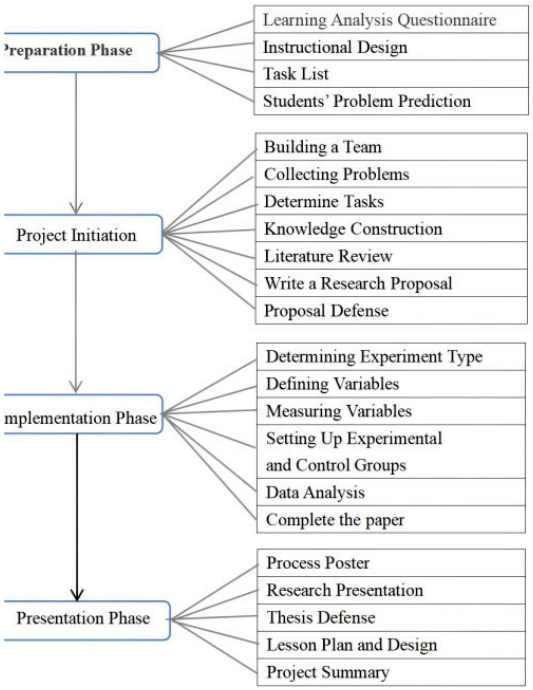
Figure 5: "Process Diversity" Course Evaluation System - Content Evaluation

3.3 Implementation of PBL

The first stage: Preparation stage. During this stage, it is necessary to communicate fully with students about "transforming the learning style". Based on the analysis of students' learning situations, teachers should carry out teaching design, including individual tasks, group tasks, group projects, as well as the composition and division of labor of group members, so that students can feel supported.

The second stage: Project establishment. In this stage, discussions are carried out in groups. When forming groups, it is necessary to consider the complementary and integrated professional backgrounds of members. According to the culture and goals established by the group, clarify tasks, construct knowledge, consult literature, form reports, and give presentations in class.

Phase 3: Project Implementation Phase. In this phase, the groups begin independent work on their clearly defined topics, collecting and analyzing data to form a research paper. The findings from the paper are then applied to the second project—course design—to promote classroom teaching reform. The teacher provides guidance and support throughout this process.



The implementation of the course is divided into four stages. (See Figure 6)

Phase 4: Results Presentation Phase. The presentation phase involves showcasing the project research outcomes. Following the path of “group discussion with the teacher—public presentation of project results by the group,” students prepare the final project research report. Each group completes their “results exhibition” poster, display setup, and \

Phase 4: Result Presentation Phase.The presentation phase is to showcase the research results of the project. Teachers and students follow the path of “discussion between the group and the teacher - public presentation of the project results through group cooperation” to prepare for the final report of the project research. Each group needs to complete the “result exhibition” poster, exhibition layout and PPT report for their own group. The teacher will complete the overall introduction of the result presentation and the course summary.

The effectiveness of the course

1 Teaching practice achievements

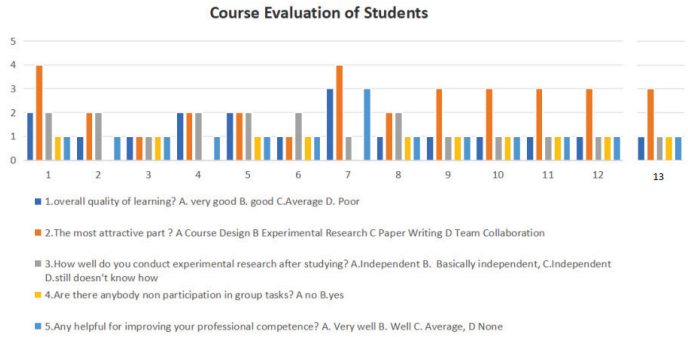


Figure 7 : Students’ Evaluation

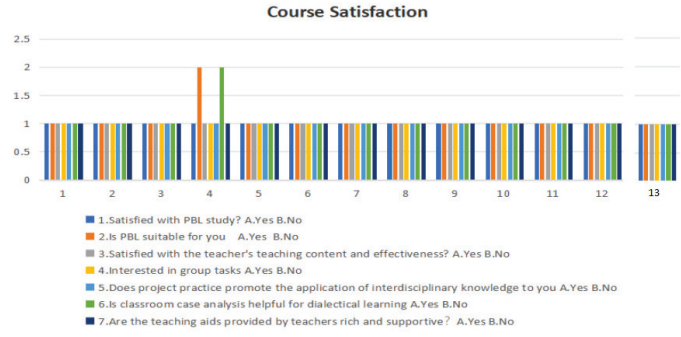


Figure 8 :Student feedback on teaching

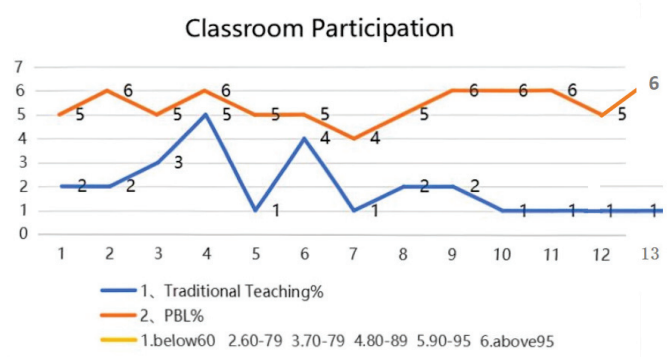


Figure9 :Self evaluation of student classroom participation

From Figures 7-9, it can be observed that the implementation of project-based teaching in the "Educational Psychology" course for master's students has achieved the following outcomes:

(1) Enhanced students' research literacy.
Within 36 class hours, from group discussions and identifying research topics to literature review and discussions, and then to collaborative division of tasks to complete the proposal, thesis writing, and defense, the following three goals were achieved to enhance graduate students' research literacy:
First, through project research, students mastered the essential basic principles and theoretical concepts of the discipline, constructing their own knowledge systems. They also developed the ability to identify, propose, and solve problems, fostering critical thinking and innovation skills.
Second, students acquired academic research and problem-solving methods while addressing project research questions. In addition to accumulating research and work experience and broadening their horizons, they learned the procedures of research and the process of thesis writing. At the same time, they gained collaboration and communication skills through project activities, enhancing their participation and social development.
Third, the division of labor and collaboration in project research cultivated personal emotions and honed individual psychological qualities. The clash of perspectives during the research process and the holistic view of task division tested individual psychological resilience, further fostering positive qualities conducive to future professionalization and self-actualization.
(2) It has stimulated students' participation.
Judging from the self-evaluation of students during the whole process of the project-based teaching activities compared with that in traditional teaching activities in the past, it is obvious that students' participation is extremely high in project-based teaching. Through the teacher's actual classroom observations, it has also been found that students are busy from in-class to after-class and from within the curriculum to outside the curriculum, and they have participated deeply in scientific research activities. Each student has self-constructed a knowledge system from a deep perspective and mastered learning and scientific research methods. At each stage of the project-based teaching method, students have cultivated the ability to solve various problems and improved their comprehensive qualities. Driven by project research, the atmosphere of classroom discussions has changed. There has been a transformation from reluctance and withdrawal to active participation in discussions, and a transformation from silence, procrastination, and forced participation to actively coping with problems and striving to find solutions to problems through practical investigations and theoretical research.

2 Feasibility analysis of PBL

Based on the practical data from this course, students completed 2 projects and 1 academic research paper within 45 class hours, and their participation rate increased from an average of 78% in traditional class-activities to over 90% in PBL. This demonstrates that PBL stimulates students' learning interest and initiative, making it a feasible approach for graduate education. Firstly, graduate students possess strong independent learning abilities and research foundations, enabling them to independently complete complex project tasks, which aligns with the goals of project-based teaching and the objectives of graduate education. Secondly, through completing project tasks and papers, students' research capabilities (such as problem definition, literature review, data analysis, and thesis writing) are comprehensively enhanced. This is an advantage of project-based learning and an effective way to achieve the goals of graduate education.

Although PBL practice has achieved certain results in the “Educational Psychology” course for graduate students, it is clear that this approach also places demands on teachers and teaching resources. Teachers need to possess project design and guidance capabilities, providing students with necessary resources and feedback. Additionally, they must integrate research resources such as databases and software tools to support the smooth implementation of projects. Of course, given the limited course time, teachers also need strong course and progress management skills to ensure the completion of the course.

Conclusion

Famous American educator Benjamin Bloom believes that the reason why the distribution of (students’ performance) shows a small number at both ends and a large number in the middle is that appropriate learning conditions have not been provided for students. If appropriate learning conditions, including correct learning methods, can be provided for students, most students can achieve excellent academic performance (Li Yuqing, 2011). Project-based teaching not only breaks through the limitations of the traditional model of “teachers actively lecturing and students passively listening”. In real project learning activities, students process, apply, and recreate basic knowledge by discovering problems, thinking independently, actively exploring, and collaborating to complete tasks. In this process, students not only learn the methods and abilities to acquire knowledge, but more importantly, their scientific research level, social development, and professional qualities are improved, and they efficiently complete the curriculum learning tasks. Therefore, project-based teaching is a teaching model suitable for postgraduate education and is worthy of promotion and application in more courses.

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