

The Application of Project-Based Learning in Medical Ethics Education

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ABSTRACT

With the advancement of medical technology and the increasing complexity of ethical issues, traditional teaching methods in medical ethics are no longer sufficient to cultivate students with strong practical and ethical decision-making abilities. This study explores the application of Project-Based Learning (PBL) in medical ethics education. The primary objective is to enhance students' ethical judgment, practical skills, and teamwork abilities through real-life case studies and diverse project activities. The findings indicate that PBL effectively enables students to apply ethical theories to real-world situations, thereby improving their communication and decision-making capabilities. The implementation of PBL has shown significant pedagogical benefits; however, challenges such as weak theoretical foundations and uneven group collaboration remain. This research provides a novel instructional model for teaching medical ethics and contributes to cultivating medical professionals who possess both ethical competence and practical capabilities, thus promoting innovation in medical education reform.

KEYWORDS

Project-Based Learning; Medical Education; Medical Ethics; Curriculum Reform; Teaching Practice

1 Introduction

With the rapid advancement of medical technology and the increasing complexity of clinical practice, medical ethics has become an increasingly important component of medical education (de la Garza et al., 2017). Traditional teaching methods in medical ethics are primarily lecture-based, where students passively receive theoretical principles and normative guidelines, often lacking opportunities for practical application (Andersson et al., 2022). Although such approaches may help students grasp foundational theories, they frequently fall short when students are faced with real-world ethical dilemmas in clinical settings, leaving them unprepared to think independently or solve problems effectively (Doukas et al., 2012). In today's medical environment—where doctor-patient relationships, clinical decision-making, and bioethical concerns are becoming more diverse and sensitive—higher demands are placed on ethics education (Lorenzini et al., 2023). Specifically, it requires the effective integration of theoretical knowledge with real-life cases, and the development of students' ethical reasoning and decision-making skills (Diamond-Brown, 2016).

Project-Based Learning (PBL), a student-centered pedagogical approach, offers new perspectives for teaching medical ethics (Larmer et al., 2015). By designing project tasks grounded in authentic scenarios, students are able to deepen their understanding of ethical principles through experiential learning, and hone their abilities to analyze and resolve ethical issues (Veselov et al., 2019). This study aims to explore the practical implementation of PBL in medical ethics education, examining its impact on enhancing students' ethical judgment, practical competence, and collaborative skills. Additionally, the study identifies potential challenges in the teaching process and proposes suggestions for improvement. The findings are expected to offer an innovative reference model for ethics education, providing a pathway toward cultivating medical students who are not only ethically aware but also capable of addressing real-world clinical ethical issues.

2 Project-Based Learning and Its Compatibility with Medical Ethics Education

PBL is a student-centered, project-driven instructional approach. Its core objective is to cultivate students' abilities in autonomous learning, teamwork, and real-world problem-solving by engaging them in the completion of practical projects (Handrianto & Rahman, 2018). Unlike traditional teaching methods that emphasize knowledge transmission, PBL focuses on organizing learning activities within authentic contexts, encouraging students to explore and practice around concrete issues (Aldabbus, 2018). Key characteristics of PBL include: problem-oriented learning, where students deepen their understanding of knowledge through addressing real-life problems; student-driven learning, with instructors acting as facilitators rather than lecturers; and learning through real-world simulations and collaboration, which promotes critical thinking and communication skills (Gary, 2015). Additionally, techniques such as role-playing and multi-perspective analysis help students internalize ethical theories and navigate decision-making dilemmas, enhancing both self-directed learning and teamwork awareness (Larmer & Mergendoller, 2010).

Due to its interdisciplinary nature, practical focus, and the complexity of ethical decision-making, medical ethics education is naturally compatible with PBL (Kim, 2020). The subject of medical ethics involves multiple domains, including

philosophy, law, sociology, and clinical medicine. Students must be capable of analyzing problems from diverse disciplinary perspectives, and PBL provides opportunities for the integration of such knowledge through case-based learning (Lee et al., 2024). Moreover, medical ethics education is grounded in real-world concerns—such as patient privacy, informed consent, and euthanasia—issues that require hands-on simulation and decision-making practice to be effectively understood. PBL fosters this kind of practical engagement by immersing students in real-life scenarios (Kokotsaki et al., 2016). Ethical dilemmas in medicine rarely have a single “correct” answer. Instead, they involve balancing competing values and stakeholder interests (Kim, 2020). PBL, with its emphasis on open-ended inquiry and collaborative discussion, encourages students to explore these multifaceted issues deeply. Through this process, they develop ethical reasoning skills and critical thinking abilities. These attributes make PBL an effective and innovative strategy for reforming medical ethics education.

3 Practical Implementation of Project-Based Learning

Incorporating PBL into medical ethics courses requires that instructional objectives and design be closely aligned to ensure both direction and practical relevance (Wang, 2022). The teaching objectives primarily encompass four aspects: First, to help students deepen their understanding and application of ethical theories by integrating abstract concepts—such as the principle of respect for autonomy and the principle of justice—into real case studies, thereby enhancing the ability to connect theory with practice. Second, to cultivate students’ capability to address real-world problems, especially in complex ethical contexts, by analyzing diverse perspectives and proposing feasible solutions. Third, to develop communication skills and teamwork awareness through group collaboration. Fourth, to foster critical thinking and ethical reasoning, enabling students to make informed and rational decisions amidst multi-dimensional value conflicts. In terms of design, project topics should be based on real-life cases and aligned with clinical practice (Si, 2020). These issues must be both authentic and controversial enough to spark students’ interest and curiosity. Project formats should be diversified, including role-plays or mock trials, allowing students to practice communication and decision-making in simulated real-world scenarios. With well-defined goals and thoughtful design, PBL supports the comprehensive development of students’ ability to connect theoretical knowledge with practical applications.

In the implementation of medical ethics courses, PBL emphasizes the integration of theory with real clinical scenarios, using a systematic process to enhance students’ comprehensive competencies (Liao et al., 2023). The process consists of four stages: project initiation, research phase, mid-term presentation, and final presentation. During the project initiation stage, instructors select real-world cases relevant to medical practice—such as “The Ethical Dilemma of Euthanasia” or “Fairness in Organ Allocation”—define learning objectives, assign students to groups, and assist in drafting research plans. The research phase is the core stage, during which students conduct literature reviews, analyze relevant laws and policies, and explore ethical theories in depth. For example, when addressing the topic of informed consent, students must balance patient autonomy with physician responsibility. Instructors provide guiding questions and resources to support deeper investigation. In the mid-term presentation stage, student groups present their preliminary findings and receive feedback from both teachers and peers, helping refine their arguments and solutions. In the final presentation stage, students demonstrate their findings using methods such as role-plays, mock trials, or case reports (Jollands et al., 2012). For instance, in a project on patient privacy, students may simulate doctor-patient communication and propose ethically grounded solutions. This entire process strengthens students’ understanding of ethical theories through practice, enhancing their problem-solving, analytical, and teamwork abilities while offering an innovative path for learning medical ethics (Rehman et al., 2024).

In terms of assessment, the focus lies on four key areas: knowledge mastery, practical problem-solving, teamwork performance, and creative thinking (Wu et al., 2018). Knowledge mastery assesses students’ understanding of core ethical theories and their ability to apply them in case studies, typically evaluated through project reports or in-class presentations (Lund, 2016). Practical problem-solving focuses on the scientific soundness and feasibility of the proposed solutions. For instance, when addressing the ethical implications of euthanasia, students are evaluated on how well they balance patient autonomy with legal and ethical standards (Karan & Brown, 2022). Teamwork performance highlights the importance of collaboration in ethical decision-making and is assessed through peer evaluation, group work analysis, and teacher observation of team dynamics (Lin & You, 2021). Creative thinking is measured by the originality and innovation in students’ case analysis and proposed solutions, which may be demonstrated through role-playing, mock trials, or debates (Chen et al., 2022). Additionally, the assessment framework emphasizes both motivation and reflection by providing constructive feedback to help students identify strengths and areas for improvement, encouraging continuous refinement of learning approaches and research skills (Traverso-Ribón et al., 2016). A scientific and comprehensive evaluation system not only reflects students’ learning outcomes objectively but also informs course optimization and continuous improvement in the application of PBL, further enhancing students’ ethical literacy and practical competence (Kokotsaki et al., 2016).

4 Teaching Reflections

The implementation of PBL in medical ethics courses has significantly enhanced students' ethical judgment, practical skills, and collaborative abilities. By analyzing real-life cases and exploring multi-dimensional ethical issues, students have learned to apply ethical theories in complex clinical contexts, weighing conflicting interests to form sound and rational ethical judgments. In terms of practical competence, students engage in literature reviews, case analyses, role-plays, and problem-solving activities, which allow them to transform theoretical knowledge into practical applications. This process strengthens their independent thinking, resource integration, and decision-making capabilities, while familiarizing them with the complexities of real medical scenarios and guiding them to propose feasible solutions. Furthermore, with group collaboration as a core element of PBL, students learn to divide tasks, communicate effectively, and integrate diverse perspectives to complete complex assignments. These experiences foster a strong sense of teamwork and responsibility. Through diverse project activities, students' abilities in ethical reasoning, hands-on practice, and team collaboration have been comprehensively improved, providing essential support for their future professional development.

Despite the notable effectiveness of PBL in medical ethics education, several challenges have emerged during implementation and require targeted improvement. First, some students may feel overwhelmed by case analysis due to weak theoretical foundations or limited practical experience. To address this, instructors should reinforce theoretical instruction at the start of the course and introduce cases using clear analytical frameworks or guiding questions to help students quickly engage with the material. Second, issues such as uneven participation and inefficient communication may arise in group work. These can be mitigated through thoughtful group assignments, well-defined task divisions, and stage-based assessments—for example, by introducing a rotating report system to ensure that each member is actively involved and develops a strong sense of collaboration. Third, students may struggle to propose innovative solutions to complex ethical problems due to limited perspectives. To broaden their thinking, educators can incorporate interdisciplinary resources or invite guest speakers to offer professional insights, thereby enhancing students' ability to analyze ethical issues from multiple disciplinary viewpoints. Lastly, to ensure the comprehensiveness and motivational value of assessment, it is recommended to combine self-evaluation, peer evaluation, and instructor feedback. A multidimensional evaluation system should be developed to assess students' theoretical understanding, problem-solving ability, teamwork performance, and creativity. These improvements can effectively address the challenges faced in implementing PBL and further enhance its impact on student development and educational outcomes.

5 Conclusion

The application of PBL in medical ethics education introduces both practicality and innovation into traditional teaching models. By engaging with real-life cases and utilizing diverse instructional methods, students are empowered to apply theoretical knowledge in complex ethical scenarios, analyze and resolve real-world problems. Activities such as role-playing, mock trials, and group collaboration not only deepen students' understanding of ethical principles but also significantly enhance their decision-making abilities and teamwork awareness. A comprehensive and multi-dimensional assessment system accurately reflects students' learning outcomes and provides a scientific basis for course improvement. However, challenges persist in the implementation process, including students' weak theoretical foundations, uneven participation in team collaboration, and a lack of innovative thinking. These issues call for proactive instructional strategies, such as reinforcing theoretical instruction, clearly structuring group tasks, and incorporating interdisciplinary resources. Overall, PBL has proven to be highly effective in stimulating student engagement and enhancing ethical judgment and practical competence. It offers strong support for the cultivation of medical professionals who possess both ethical literacy and hands-on problem-solving skills, thereby injecting new vitality into the reform and development of medical education.

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