

Teaching Medical Ethics and Law Using The Quiz-Based Team Learning (QTL) Approach

Hazdalila Yais Haji Razali

Faculty of Medicine, Universiti Teknologi MARA, 46000, Sungai Buloh, Malaysia,
Corresponding Author Email: hazdalila@uitm.edu.my

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Abstract

This action research investigates the integration of gamification into the traditional Team-Based Learning (TBL) model, specifically through the Quiz-Based Team Learning (QTL) approach, for teaching medical ethics and law. It aims to assess the impact of QTL on student learning outcomes in this subject area. Employing a quantitative survey methodology, data were collected from participants through a structured instrument. The research was conducted during a tutorial session involving 50 third-year medical students at one of the public universities in Malaysia, with a focus on the topic of medical negligence under the Ethics and Medical Jurisprudence module. Due to the voluntary nature of participation, only 14 students took part in the study. Results indicate that 71.4% (10 out of 14) of respondents strongly agreed that the QTL approach positively influenced their understanding of legal concepts in medical education. Furthermore, when comparing the results of the quiz taken at the start and at the end of the tutorial, there was a marked increase in results in the latter. Despite the low response rate, these findings suggest that QTL holds promise for enhancing student engagement, teamwork, fostering critical thinking, and improving comprehension of medical ethics and law. The implications of this study extend to the potential enhancement of pedagogical practices in medical education, particularly within the realm of ethics and medical jurisprudence.

Keywords: Gamification, Medical Law, Quiz-Based Team Learning (QTL), Team-Based Learning (TBL), Problem-Based Learning (PBL), Learning Outcomes

Introduction

Background of the Study

At Universiti Teknologi MARA, Malaysia (UiTM), the Ethics and Medical Jurisprudence (EMJ) course is delivered to third, fourth, and final year medical students. As one of the required topics in the syllabus for medical ethics and law at the undergraduate level set by the Malaysian Medical Council, understanding medical negligence is important for medical students, especially for their future practice as healthcare professionals. Within the EMJ curriculum at UiTM, medical negligence is covered in the third year as one of the fifteen

sessions scheduled for that academic year. This topic is allocated two hours of lecture time, supplemented by an additional hour of tutorial sessions. However, despite the foundational level of understanding expected, teaching and learning this subject can pose challenges for both students and instructors. Therefore, exploring innovative teaching methodologies, such as the Quiz-Based Team Learning (QTL) approach, becomes imperative to enhance students' comprehension and prepare them for future challenges.

Statement of Problem

Although law and medicine originate from distinct fields, they frequently intersect, forming legal medicine under five primary conditions: Firstly, legal regulations govern the conduct and registration of medical practitioners, serving as protective measures against fraudulent practices and abuses of power. Secondly, laws also prescribe certain regulations on conducting medical procedures, such as the Human Tissue Act and the Mental Health Act in Malaysia. Thirdly, medical and scientific methods may be utilized as evidence in legal cases, such as those involving paternity disputes, causes of death, or instances of rape. Fourthly, when patients suffer adverse outcomes following treatment, the law provides means for compensation within the realm of tort law. Lastly, when a medical intervention falls within a grey area, court opinions are sought to resolve contentious issues such as the rights of the fetus in cases of abortion.

Thus, integrating legal concepts into medical education curricula holds promise for enhancing community welfare, particularly among vulnerable populations, and removing barriers to accessing adequate healthcare (Cohen et al., 2017). Nevertheless, introducing legal concepts to medical students proves challenging due to their different nature. Therefore, bridging the gap between medical and legal concepts necessitates thorough explanation and contextualization, extending beyond traditional didactic teaching strategies.

The second difficulty identified when delivering this topic is that the conventional way of teaching medical ethics and law courses, which relies heavily on lectures, provides information but may not necessarily enhance students' intrinsic motivation for learning. This issue is also highlighted by Chen et al (2022), who used interdisciplinary court-based learning (CBL) to increase student's motivation to learn while strengthening medical professionalism and medical law, developing students' empathy for patients and communication skills, as well as building students' trust in the justice system. However, due to restrictions at our centre such as time, personnel, and costs, the instructional strategies designed to deliver tutorials on this topic have been varied to include Problem-Based Learning (PBL) and Flipped Classrooms. In our tutorials, students were divided into small groups consisting of 10–12 students. They were given topics, legal cases, and clinical scenarios to discuss at home and present it in the classroom, with the instructor serving as a facilitator to guide the discussion and ensure understanding. This is where the flipped classroom concept takes in, students were given the lecture a week before and then they were expected to extract important elements of medical negligence from specific decided case law and suggest solutions for hypothetical problems. However, it has been identified from previous batches that some students may not actively participate in group work or contribute at all. Hence, enhancing the delivery technique becomes imperative, prompting the exploration of alternative group-based activities such as Team-Based Learning (TBL) as an alternative instructional strategy in medical education (Chung et al., 2009).

However, Medical ethics and law often involve complex and nuanced ethical and legal dilemmas that may not be effectively addressed or gain attention within the structured framework of TBL. The conventional use of pen and paper in TBL may still fail to address the passive behaviour of students and also does not increase their enthusiasm or engage their interest. Therefore, the author innovated the teaching method by integrating gamification into TBL to attract more attention, improve understanding, and increase engagement. Quiz-Based Team Learning (QTL) is designed to maximize the benefits of TBL while integrating elements of gamification to enhance student interest and engagement.

Objective of the Study and Research Questions

This study aims to explore effective strategies for overcoming the challenge of introducing legal concepts to medical students, considering the inherent differences between these disciplines. Secondly, it aims to investigate how the conventional method of teaching medical ethics and law courses can be improved not only to convey information but also to boost students' intrinsic motivation for learning. Thirdly, the study aims to analyse which teaching strategies can effectively tackle the challenge of low participation or contribution in group work while doing TBL among students. Finally, the study aims to propose an innovative approach derived from TBL to develop a method that enhances student attention, improves understanding, and fosters increased engagement.

Therefore, it is proposed that the trio of challenges identified—introducing legal concepts to medical students, alleviating the monotony associated with traditional teaching methods, and encouraging active participation in group activities—can be overcome by adopting an innovative pedagogical approach. Known as "Quiz-Based Team Learning (QTL)," this strategy seamlessly integrates gamification into the structure of Team-Based Learning (TBL) during both individual question answering and group work, effectively tackling the obstacles of legal concept introduction, combating instructional monotony, and promoting lively engagement in collaborative tasks.

This study is conducted to address the following inquiries:

- i) How do learners perceive the preparation phase in the QTL approach?
- ii) How do learners perceive the interactive quiz session in the QTL approach?
- iii) How do learners perceive the group discussion and presentation stages in the QTL approach?

Literature Review

Many studies have investigated the efficacy of various pedagogical approaches in medical education, particularly in addressing the complexities of legal concepts. Tuma (2021) conducted a review of educational technology applications in medical education, focusing on interactive learning during lectures. The integration of technology aims to address challenges in promoting interactivity in large groups. The review emphasizes the importance of aligning technology usage with educational needs to optimize learning outcomes. Specific roles, objectives, and prerequisites for technology integration are essential for achieving optimal results. Selected technologies can enhance learner engagement and participation in educational activities.

Andersson et al (2022) conducted an integrative systematic review aiming to explore the available literature on ethics education that supports the learning of ethical competence

among healthcare professionals and students undergoing healthcare training. The study emphasizes the importance of designing education to facilitate opportunities for receiving and creating meaning from information, altering one's values and attitudes, and assessing the consequences of one's actions to support learning. Interaction with peers is highlighted as crucial, as it provides valuable knowledge and feedback on understanding and correct actions. The review identifies various design strategies for ethical competence learning, such as theoretical lectures, literature reading, practical activities, workshops, case studies, problem-solving sessions, role-play, simulation activities, narratives, storytelling, and small group discussions. Additionally, the review discusses the role of educational technologies, such as the internet and video conferencing, in facilitating discussions and delivering education, particularly in rural settings. However, the study notes that the effectiveness of different design strategies in promoting the development of a "professional self" and ethical competence remains challenging to determine and emphasizes the importance of selecting strategies that optimize learning objectives while cautioning against activities that may impede ethical competence development.

Cognitive Load Theory in Medical Ethics and Law

Cognitive Load Theory, proposed by John Sweller, is a framework that seeks to understand how the human mind processes information and learns effectively. According to Sweller (1988), the theory suggests that learners have a limited capacity for processing information, and when this capacity is exceeded, learning becomes difficult. Cognitive Load Theory identifies three types of cognitive load: intrinsic, extraneous, and germane. Intrinsic load refers to the inherent complexity of the material being learned, while extraneous load pertains to the cognitive burden imposed by the instructional design or presentation of the material. Finally, germane load relates to the mental effort invested in creating meaningful connections and schema for the new information. By applying Cognitive Load Theory to the introduction of legal concepts in medical education, we can offer valuable insights into optimizing the learning experience for students. By recognizing the inherent complexity of legal terminology and principles (intrinsic load), educators can strategically scaffold the delivery of this content, breaking it down into manageable chunks and providing appropriate support materials. Furthermore, instructors can minimize extraneous cognitive load by employing instructional strategies that reduce cognitive overload, such as using visual aids, real-life case studies, and interactive activities. By doing so, students can focus their cognitive resources more effectively on understanding the legal concepts rather than struggling with the presentation format. Moreover, by promoting the creation of meaningful mental representations (germane load) through active learning and problem-solving activities, educators can enhance students' comprehension and retention of legal principles.

Problem-Based Learning

Problem-Based Learning (PBL) has been increasingly utilized in medical education, including the teaching of medical ethics and law. Originating in McMaster University's medical program in the mid-1960s, PBL offers an active learning approach that encourages students to synthesize and integrate complex information, a critical skill in understanding and navigating the intricacies of medical ethics and law (Hopper, 2018). However, while the adoption of PBL in medical education has been widespread, its theoretical foundations in teaching medical ethics and law have not been fully elucidated. Rebecca et al (2016) conducted a review of teaching and learning theories to shed light on the theoretical underpinnings of PBL in the

context of medical ethics and law education. Through their exploration, they identified eight principles associated with teaching and learning through PBL, including constructivism, experiential learning, social learning, and collaborative/cooperative learning. These principles offer valuable insights into how PBL can effectively facilitate the understanding and application of medical ethics and law concepts. For instance, in the teaching of medical ethics and law, constructivism emphasizes the importance of active engagement and the construction of knowledge through meaningful experiences and interactions. Experiential learning allows students to explore ethical dilemmas and legal frameworks through real-life case studies and simulations, fostering deeper understanding and critical thinking skills. Social learning encourages collaboration and discussion among students, enabling them to explore diverse perspectives and ethical viewpoints. Furthermore, the collaborative/cooperative learning aspect of PBL encourages students to work together in teams to analyze and solve ethical and legal challenges, promoting teamwork skills and peer learning. By incorporating these principles into the design of PBL modules for teaching medical ethics and law, educators can create dynamic and engaging learning experiences that prepare students to navigate complex ethical and legal issues in their future medical practice.

Team-Based Learning

Team-Based Learning (TBL), pioneered by Professor Larry Michaelsen in the 1980s, initially found its application in business schools but has since emerged as a valuable instructional strategy in various disciplines, including medical ethics and law (Hopper M.K., 2018). Conceived as a response to the challenges posed by burgeoning class sizes and concerns about the effectiveness of traditional lecture-based approaches (Burgess, McGregor, & Mellis, 2014), TBL offers a structured framework that fosters engaging teaching practices while accommodating large student cohorts. It emphasizes immediate feedback, student participation in decision-making processes, and active engagement through small group activities and class discussions (Burgess et al., 2020). In the context of teaching medical ethics and law, TBL aligns with the principles of social constructivism, which asserts that learning is enhanced through interaction with others and the construction of knowledge within a social context (Michaelsen & Sweet, 2011). By dividing students into small groups to collaborate on tasks and problem-solving

activities, TBL encourages active participation and the exchange of diverse perspectives, crucial for grappling with complex ethical and legal dilemmas in healthcare. TBL incorporates active learning principles, wherein students take an active role in their learning process, and cooperative learning strategies, fostering collaboration to achieve shared learning objectives. Students are typically provided with pre-class materials or lectures to establish a foundational understanding of medical ethics and law. During class sessions, they engage in application exercises and discussions within their teams to deepen their understanding and reinforce their learning. Moreover, TBL integrates assessment components, such as individual readiness assurance tests (RATs) and group application activities, to evaluate students' comprehension and promote accountability within the team. By immersing students in a collaborative learning environment grounded in social constructivist principles, TBL offers a robust approach to teaching medical ethics and law, preparing future healthcare professionals to navigate the complexities of ethical decision-making in clinical practice.

Gamification in Teaching Medical Ethics and Law

Gamification, rooted in principles of behavioural psychology and game design, is a pedagogical approach that leverages elements of game mechanics to enhance engagement, motivation, and learning outcomes. According to Zaric et al (2021), the Gamified Learning Theory suggests that gamification indirectly impacts learning by influencing learning-related behaviours through a mediating or moderating process. The application of gamification in education could relate to theories such as self-determination theory, which posits that intrinsic motivation, autonomy, and competence are key drivers of enhanced self-motivation and mental health (Ryan & Deci, 2000). By integrating game elements such as points, badges, leaderboards, and challenges into educational activities, gamification aims to create a more immersive and interactive learning experience. In the context of teaching medical ethics and law, gamification can be applied to stimulate student interest, promote active participation, and reinforce learning of complex ethical principles and legal concepts. For example, educators can design gamified scenarios or simulations that present students with ethical dilemmas commonly encountered in healthcare practice, challenging them to apply their knowledge and make informed decisions.

Rationale for Investigating Teaching Strategies in Medical Ethics and Law Education

Conducting this study is imperative to address existing gaps in medical education concerning the effective teaching of medical ethics and law. Despite the widespread adoption of pedagogical methods like Problem-Based Learning (PBL) and Team-Based Learning (TBL), there remains a lack of comprehensive understanding regarding their theoretical underpinnings in teaching legal concepts. By investigating the efficacy of these methods, particularly in promoting ethical competence among healthcare professionals, this study aims to contribute to the refinement of teaching strategies tailored to the complexities of medical ethics and law.

Addressing Knowledge Gaps and Advancing Pedagogical Innovation

Previous research has explored various instructional approaches in medical education, yet gaps persist in understanding how these methods effectively facilitate the learning of medical law among medical students. By examining the application of Cognitive Load Theory, Problem-Based Learning, and Team-Based Learning in teaching medical ethics and law, this study seeks to address these gaps. Moreover, by synthesizing insights from existing literature and proposing innovative instructional strategies, such as integrating gamification, this study aims to contribute novel perspectives on enhancing student engagement and learning outcomes in medical ethics and law education.

Conceptual Framework of the Study

The conceptual framework of the study is based on the integration of various factors influencing the effectiveness of teaching medical ethics and law using innovative pedagogical approaches. The framework incorporates key components such as teaching methodologies, student engagement, learning outcomes, and the challenges associated with traditional teaching methods. Additionally, it considers the potential impact of alternative teaching methods, such as problem-based learning and Quiz-Based Team Learning (QTL), on addressing these challenges and enhancing learning outcomes in medical education.

Methodology

Research Design

Aligned with the dynamic and iterative nature of action research, this study employs an action-oriented mixed-methods design. This approach enables a structured inquiry into and refinement of teaching practices within medical education through iterative cycles of planning, action, observation, and reflection. By integrating both quantitative and qualitative components, this methodology offers a comprehensive examination of the efficacy of the Quiz-Based Team Learning (QTL) approach. However, due to limited participation, with only 14 students responding to the questionnaire two weeks after its opening, the study leverages additional evidence gathered during tutorials. Utilizing data from Quizizz sessions conducted during tutorials provides supplementary insights into the effectiveness of the approach in enhancing student understanding. This adaptive research design allows for a nuanced understanding of the impact of QTL on student learning outcomes, combining both self-reported perceptions and objective assessment measures.

Population and Sample

The study population comprises third-year medical students who have participated in QTL sessions conducted by the researcher. A sample of 52 students is selected from this population, ensuring representation from diverse backgrounds and learning experiences. The study is conducted within the academic setting of a public university in Malaysia.

Instrument

Data collection is facilitated through a bespoke survey questionnaire tailored specifically for this study, incorporating both quantitative and qualitative elements. The survey comprises multiple sections meticulously crafted to gather comprehensive feedback from students regarding their perceptions, experiences, and suggestions for improvement concerning the Quiz-Based Team Learning (QTL) approach. Additionally, to complement the questionnaire data, insights from Quizizz sessions conducted during tutorials serve as supplementary evidence to measure the effectiveness of the approach in enhancing student understanding. This multifaceted instrument allows for a thorough exploration of the impact of QTL on student learning outcomes, capturing both subjective insights and objective assessment measures.

Method of Data Collection

The survey questionnaire is distributed electronically to the target population of third-year medical students who have participated in Quiz-Based Team Learning (QTL) sessions. Participants receive clear instructions on completing the survey to ensure consistency and accuracy in their responses. To encourage candid feedback, anonymity is preserved throughout the process. Additionally, data from Quizizz sessions conducted during tutorials are collected and integrated into the analysis, providing supplementary evidence to gauge the effectiveness of the QTL approach in enhancing student understanding. This method of data collection allows for a comprehensive examination of student perceptions and objective measures of learning outcomes.

Method of Data Analysis

Data collected from the survey questionnaire undergo a rigorous analysis employing both quantitative and qualitative methods. Quantitative data, including Likert-scale responses, are

subjected to descriptive statistical analyses to summarize participants' perceptions and experiences. Qualitative data, such as open-ended responses, are thematically analysed to identify recurring patterns and themes in students' feedback. The integration of quantitative and qualitative analyses offers a comprehensive understanding of students' experiences with QTL, thus informing recommendations for future enhancements in teaching practices.

Findings

The action research involved administering a survey to 52 students who attended the tutorial session implementing the Quiz-Based Team Learning (QTL) approach. However, only 14 students participated in the survey, and their responses on the Likert scale appeared superficial, potentially reflecting a lack of engagement.

Findings for Preparation Phase

This section presents data to answer research question 1- How do learners perceive the preparation phase in the QTL approach? In the initial section, we sought to address the first research question: How do learners perceive the preparation phase in the QTL approach? Through the exploration of learners' perceptions using five targeted questions, significant insights emerged. Firstly, an overwhelming majority (92.9%) of respondents strongly agreed that the lecture delivered one week before the tutorial significantly contributed to their grasp of foundational knowledge in medical negligence. Similarly, a substantial proportion (85.7%) expressed strong agreement regarding the beneficial nature of collaborative group work in preparing presentations before the tutorial. However, the percentage decreased slightly when considering the effectiveness of preparing a presentation using PowerPoint, with only 78.6% of participants strongly agreeing that it enhanced their understanding of the material. Additionally, a notable finding revealed that fewer respondents (64.3%) felt adequately prepared for the tutorial session after completing the preparation phase, with 35.7% expressing agreement. Despite this, a considerable percentage (71.4%) strongly agreed that the preparation phase bolstered their confidence in discussing medical negligence concepts with their peers.

Nonetheless, qualitative feedback shed light on their experiences. One student expressed enjoyment and noted enhanced retention of knowledge, suggesting a preference for similar interactive presentations. Another student highlighted the enjoyable group dynamics and improved understanding of the topic, while suggesting more real cases for discussion. Another student appreciated the competitive nature of the quizzes, contributing to a fun and effective learning experience. Notably, one student expressed overall satisfaction with the class and lecturer, emphasizing a consistently productive and enjoyable learning environment. These responses underscore the positive impact of the tutorial's interactive and engaging approach, encouraging further implementation of similar strategies to foster learning and knowledge acquisition.

At the beginning of the tutorial session, a set of multiple-choice questions (MCQs) was administered through a gamification process to assess students' understanding before the tutorial commenced. The questions were answered individually, and the mean score was only 41% with the highest mark achieved at 77%.

Findings for interactive quiz session

This section presents data to answer research question 2- How do learners perceive the interactive quiz session in the QTL approach? The findings suggest a predominantly positive perception of the interactive quiz session among learners, with participants highlighting its role in facilitating reflection, identifying areas for improvement, enhancing confidence, and reinforcing understanding. Specifically, engaging in a second round of group discussion after all groups presented was perceived as beneficial for reflecting on initial responses and promoting deeper understanding. Comparing group responses with correct answers during the second group discussion was reported to be helpful in identifying knowledge gaps and areas for improvement. Moreover, the second group discussion was seen as instrumental in enhancing confidence in applying legal concepts to real-world scenarios and promoting critical thinking and problem-solving skills through discussions of discrepancies or uncertainties. Additionally, participants noted that the second group discussion reinforced their understanding of medical negligence, contributing to a holistic learning experience. The positive perceptions of the interactive quiz session underscore its effectiveness in promoting active engagement, reflection, and application of knowledge among learners within the QTL approach. The interactive nature of the session encourages collaborative learning and fosters a deeper understanding of complex concepts. However, the presence of some reservations suggests potential areas for refinement, such as providing clearer guidelines for group discussions and addressing any concerns regarding assessment criteria. By incorporating feedback from participants and refining instructional practices, educators can optimize the interactive quiz session to better meet the diverse needs of learners and enhance their learning outcomes.

Findings for Group Discussion, Presentation

This section presents data to answer research question 3-How do learners perceive the group discussion and presentation stages in the QTL approach? Participants expressed generally positive perceptions of both the presentation and second group discussion stages within the QTL approach. Presenting solutions and reasoning, listening to presentations from other groups, providing feedback, and engaging in constructive discussions were perceived as beneficial for enhancing understanding and fostering collaboration. The second group discussion stage was particularly valued for its role in promoting reflection, identifying areas for improvement, and reinforcing knowledge. Overall, participants provided positive feedback regarding the QTL approach, emphasizing its effectiveness in enhancing understanding and creating a fun learning environment.

Moreover, following the first group discussion, the mean score significantly increased to 73%, with the highest score reaching 85% by a group comprising students who performed well in the initial quiz. Subsequently, after the presentation session, the mean mark for the group quiz rose to 88%, with the highest score of 100% attained by the group with the highest overall and individual scores. These findings suggest that the collaborative nature of the QTL approach, coupled with opportunities for group discussion and presentation, significantly enhanced student comprehension and performance throughout the tutorial session.

Discussion

Based on our investigation into the preparation phase encompassing lectures, group discussions, and PowerPoint presentations, it appears that lectures are perceived as

particularly beneficial in preparing learners for their studies. However, there is a noticeable decrease in confidence when considering the effectiveness of preparing slide presentations in enhancing understanding. This suggests a nuanced relationship between different preparatory activities and their perceived impact on learners' confidence levels. Such findings underscore the importance of tailored instructional strategies within the preparation phase of the QTL approach. Moving forward, educators may benefit from prioritizing methods such as lectures while reassessing the efficacy of PowerPoint presentations to ensure they effectively contribute to learners' comprehension and confidence-building efforts. These insights provide valuable guidance for refining teaching practices to better meet the diverse learning needs of students in medical education settings.

By incorporating gamification into Team-Based Learning, the QTL approach promotes active engagement, collaboration, and critical thinking among students, ultimately enhancing their understanding and retention of legal concepts in medical education. Quizzizz adds an interactive dimension to the learning process by incorporating features such as power-ups, music, graphics, and live scoring. These elements increase student engagement and motivation by making the learning experience more dynamic and enjoyable. The use of power-ups, for instance, encourages active participation by allowing students to earn rewards for correct answers, tapping into principles of gamification to promote intrinsic motivation. Quizzizz provides immediate feedback to students during the quiz sessions, reinforcing learning and aiding in the correction of misconceptions. Immediate feedback is a key component of effective learning as it helps students identify errors and adjust their understanding in real-time (Hattie & Timperley, 2007). QTL maintains the collaborative nature of TBL by promoting teamwork and discussion among students within their teams. The addition of interactive quizzes encourages peer-to-peer learning and collaboration as students work together to solve problems and achieve common goals (Johnson & Johnson, 2009). The incorporation of Quizzizz elements aligns with the principles of active learning, where students take an active role in their learning process. Interactive quizzes stimulate cognitive engagement and reflection, fostering deeper understanding and retention of course material (Prince, 2004). The interactive nature of QTL encourages social interaction and cooperative learning among students, consistent with social learning theory. According to Bandura (1977), learning occurs through observation, imitation, and social reinforcement, highlighting the importance of peer interaction in the learning process. In summary, QTL builds upon the foundation of TBL by integrating interactive elements from Quizzizz to enhance student engagement, promote active learning, and provide immediate feedback. By incorporating principles of gamification, active learning, and social learning theory, QTL offers a dynamic and effective approach to team-based learning in medical education. Moreover, QTL embraces modern technology, recognizing its relevance to the current generation, which tends to be more tech-savvy. This innovation acknowledges the shift towards digital tools and platforms, offering an alternative to traditional pen-and-paper methods utilized in classical TBL.

The findings of this action research shed light on the effectiveness of the Quiz-Based Team Learning (QTL) approach in enhancing student engagement and comprehension in the teaching of medical ethics and law. Despite the challenges encountered with survey response rates and superficial responses, qualitative feedback from participating students indicated a positive reception of the interactive and engaging nature of the tutorial sessions. Students

expressed enjoyment, improved understanding, and satisfaction with the overall learning experience, highlighting the effectiveness of incorporating interactive elements into teaching methodologies.

Furthermore, the analysis of Quizizz results provided quantitative evidence supporting the benefits of the QTL approach. The progressive improvement in mean scores across successive quiz sessions reflects the positive impact of collaborative learning, group discussions, and presentations on student comprehension and performance. The significant increase in mean scores following group discussions and presentations underscores the effectiveness of active learning strategies in reinforcing understanding and retention of legal concepts in medical education.

The findings also align with existing literature on pedagogical approaches in medical education. Previous studies have highlighted the importance of interactive and experiential learning methods, such as problem-based learning and team-based learning, in promoting student engagement and deep learning. The QTL approach builds upon these principles by integrating interactive quizzes, group discussions, and presentations to create a dynamic and immersive learning environment.

Conclusion

In conclusion, this action research demonstrates the effectiveness of the Quiz-Based Team Learning (QTL) approach in addressing the challenges associated with teaching legal concepts to medical students. By fostering active engagement, collaboration, and reflection, the QTL approach enhances student comprehension, retention, and application of legal principles in clinical practice. The positive feedback from participating students and the quantitative improvement in quiz scores underscore the value of incorporating interactive and experiential learning methods into medical education curricula.

Moving forward, further research is warranted to explore the long-term impact of the QTL approach on student learning outcomes and clinical practice. Additionally, future studies could investigate variations of the QTL approach and its applicability across different disciplines and educational settings. Overall, the findings of this action research contribute to the ongoing discourse on innovative teaching methodologies in medical education and provide valuable insights for educators seeking to enhance student engagement and comprehension in legal medicine.

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