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The role of midwifery students in contraceptive counseling role play: evaluation of the tpack approach

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ABSTRACT

This study aims to evaluate the effectiveness of the TPACK (Technological, Pedagogical, and Content Knowledge) approach in contraceptive counseling training through role play for fourth-semester DIII Midwifery students in the Family Planning (KB) Services course. This research uses a qualitative approach with a case study research design. Data was collected through in-depth interviews with 15 students as research participants. The research results show that students understand the TPACK concept well and see it as a practical approach to learning contraceptive counseling. Integrating technology, pedagogy, and content in learning is considered to help students understand the material better. Role play has proven effective in honing students' contraceptive counseling skills and increasing their confidence in facing real counseling situations. This research also identified several challenges, such as limited access to technology. Therefore, efforts are needed to increase technological support and sustainable development in implementing TPACK in health education. Overall, the TPACK approach has great potential in improving the quality of contraceptive counseling learning and preparing midwifery students to become competent counselors.



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Introduction

Contraceptive counseling ensures optimal reproductive health (Bullington et al., 2023). By providing accurate and comprehensive information about various contraceptive methods, this counseling empowers individuals to make appropriate and informed decisions (Karra & Zhang, 2021). These decisions have an impact on preventing unwanted pregnancies (Troutman et al., 2020; Auerbach et al., 2023), as well as contributing to overall reproductive health (Cavallaro et al., 2020; Khan & Islam, 2022). As awareness and access to contraceptive methods increase, the need for qualified contraceptive counselors increases (Comfort et al., 2021). Amid the growing need for qualified contraceptive counselors, several challenges have emerged. One of them is the lack of adequate training for healthcare providers such as midwives and doctors, not all of whom have specialized training in contraceptive counseling (Huysman et al., 2021). Apart from that, there are limited resources, such as training programs and educational materials, which are still limited. Another challenge is the need for diverse skills. An effective contraceptive counselor knows contraceptive methods and must have good communication, empathy, and counseling skills (Ermias et al., 2023).

Contraceptive counseling is increasingly crucial as awareness and access to contraceptive methods increases. Midwifery students are essential in providing these services as part of their education and training. Equipping them with adequate counseling knowledge and skills is the key to producing quality counselors (Yamamoto et al., 2023). Challenging contraceptive counseling education can be addressed using the TPACK (Technological, Pedagogical, and Content Knowledge) model as an innovative solution. TPACK integrates three main components: Technological Knowledge, Pedagogical Knowledge, and Content Knowledge (Mutiani et al., 2021; Absari et al., 2020). Integrating these three components in contraceptive counseling education is expected to improve the quality of students' learning and understanding of contraceptive counseling, develop practical counseling skills, and prepare students to become qualified and professional contraceptive counselors. TPACK offers an innovative solution to overcome the limitations of conventional methods in learning contraceptive counseling.

Traditional methods are often limited to limited access to material during learning sessions. At the same time, descriptions of real situations in the field are only presented through a scenario, so students may not be ready to face complex situations. TPACK encourages the effective integration of technology in teaching and learning contraceptive counseling, thereby improving the quality of education. The application of TPACK in contraceptive counseling education includes multimedia simulations, real case studies discussed interactively, online learning platforms, and enhanced with role play through laboratory practicums. Multimedia simulation allows students to practice counseling through interactive video simulations (Kotiasih et al., 2022). Interactive case studies provide practical experience in handling complex counseling situations (Prosek & Gibson, 2021). Meanwhile, online learning platforms offer access to various educational materials (Supriyanto et al., 2020), such as interactive modules and video tutorials, which enable students to learn independently and collaborate (Tarigan et al., 2021). In the final stage of learning, students play roles with simulated patients in laboratory practical learning. Integrating technology and methods can increase student engagement, increase the accessibility of learning materials, and develop counseling skills (Wang & Ji, 2021).

A study of midwifery students in England found that most students' self-confidence varied depending on the contraceptive method (Walker & Davis, 2014). These findings indicate they have inadequate abilities and are not ready to carry out the role of counselors in all situations (Reza, 2016). The root of the problem of this condition is the low attainment of knowledge and skills (Bradfield et al., 2022). Several factors that influence this situation are a limited presentation of learning material, low-case interaction, and lack of opportunities for role-play practice. The TPACK approach to contraceptive counseling education offers unique advantages over conventional methods. Integrating technology in TPACK enables more dynamic and interactive learning, providing in-depth practical experience for students. One of the main innovations in this approach is role play in teaching contraceptive counseling. Through role-play, midwifery students can practice dealing with complex counseling situations in a safe and structured environment, strengthening their communication and empathy skills. Another advantage of TPACK is its ability to provide more comprehensive simulations of real situations so that students can hone their skills before entering the field.

The main objective of this research is to evaluate the effectiveness of the TPACK approach in contraceptive counseling training for midwifery students through role-play. This research aims to identify how well the TPACK approach can increase students' knowledge, skills, and confidence in carrying out contraceptive counseling. Apart from that, this research also aims to explore students' experiences using technology as part of learning contraceptive counseling and how this affects their readiness to practice in the field. Implementing TPACK is expected to improve the quality of contraceptive counseling education, thereby producing counselors who are more skilled and ready to face challenges in the field. In addition, the results of this research can encourage further development of technology-based learning methods in other areas of health education, reinforcing the importance of integrating technology in education to improve learning outcomes and student professional readiness.

Method

This research **used** a qualitative approach to evaluate the effectiveness of the TPACK approach in contraceptive counseling training through role play for fourth-semester DIII Midwifery students in the Family Planning Services course. The subjects of this research consisted of 15 students enrolled in this course. Data is collected through various techniques. First, researchers conducted participant observation during role-play sessions, recording student interactions and responses while acting as contraceptive counselors. This observation focuses on communication skills, the use of technological knowledge, and the pedagogical approaches students apply. Next, in-depth interviews were conducted with all participants after the role-play session. This semi-structured interview explored students' experiences, perceptions, and understanding of using the TPACK approach in

learning contraceptive counseling. Each interview lasted 30–45 minutes and was recorded with permission from the participant.

In addition, researchers also collected and analyzed learning materials, interactive modules, and student reflection notes to gain further insight into how TPACK is implemented in the curriculum and its impact on student learning. A focus group discussion (FGD) was conducted with participants to discuss their experiences collectively and identify the challenges and benefits of using TPACK in contraceptive counseling learning. The data collected was analyzed using the thematic analysis method. The first step in this analysis was the verbatim transcription of all interviews and FGD discussions. Transcribed data were then coded to identify emerging themes and patterns. These initial codes were then grouped into main themes that reflected student experiences and perceptions. The identified themes were interpreted to understand the effectiveness and impact of the TPACK approach in contraceptive counseling learning. This research also considered the ethical aspects of qualitative research, including maintaining the confidentiality of participants' identities and obtaining written consent from all participants before the research began.

To evaluate the effectiveness of the TPACK approach in contraceptive counseling training through role play, in-depth interviews with fourth-semester DIII Midwifery students will cover several key indicators. These indicators are designed to explore students' experiences, perceptions, and understanding of using the TPACK approach. The following are several indicators that can be used as a reference in interviews:

Tabel 1. Interview indicators

Kategori	Indikator	Pertanyaan
Understanding of TPACK	Understanding the TPACK concept in learning contraceptive counseling	How do you understand the concept of TPACK in the context of learning contraceptive counseling?
	Differences from previous learning methods	Do you feel this approach differs from the learning methods you have followed before? If yes, how is it different?
Learning Experience with TPACK	Experiences during contraceptive counseling learning sessions with TPACK	Tell us about your experience during the contraceptive counseling learning session using the TPACK approach.
	Technology assistance in understanding the material	How does integrating technology (e.g., multimedia simulations and online learning platforms) help you understand contraceptive counseling material?
Role Play Effectiveness	The influence of role play in honing counseling skills	How does role play help you hone your contraceptive counseling skills?
	Increased self-confidence after a role-play session	Do you feel more confident in counseling after attending a role-play session? Why?
Developed Skills	Skills developed during learning with TPACK	What skills did you develop while learning with the TPACK approach?
	Improved communication and empathy skills	Do you feel your communication and empathy skills have improved after participating in a role-play session? Explain.
Benefits and Challenges of TPACK	Benefits of learning with the TPACK approach	What benefits do you feel from learning with the TPACK approach?
	Challenges faced during learning	Are there any challenges you face while following this learning approach? How do you overcome these challenges?
Readiness to Become a Contraception Counselor	Readiness to become a contraceptive counselor after learning with TPACK	To what extent do you feel ready to become a contraceptive counselor after studying with the TPACK approach?

Kategori	Indikator	Pertanyaan
	Learning aspects that need to be improved	Are there any aspects of your learning that need to be improved to prepare you better to become a competent counselor?
Feedback and Suggestions	Suggestions for improving the effectiveness of the TPACK approach	Do you have suggestions or input to increase the effectiveness of the TPACK approach in contraceptive counseling learning?
	TPACK elements that must be maintained or developed	Are there elements of the TPACK approach that you think should be retained or further developed?

Results and Discussions

This research evaluates the effectiveness of the TPACK approach in contraceptive counseling training through role play for fourth-semester DIII Midwifery students in the Family Planning (KB) Services course. The results of this study indicate that the TPACK (Technological, Pedagogical, and Content Knowledge) approach has significant potential to improve the quality of contraceptive counseling learning for midwifery students.

Understanding of TPACK

Most students understand the TPACK concept well in the context of learning contraceptive counseling. They identified TPACK as integrating technology, pedagogy, and content to create more interactive and practical learning. Some students emphasized that this approach differed from previous learning methods that were more traditional and less interactive.

One student stated,

"...But, the TPACK approach makes us understand more about how technology, teaching methods, and materials can be combined in learning. This is very different from the way I usually learn..." (Student A)

This understanding shows that TPACK can provide a clear framework for combining technology, pedagogy, and content. This finding is strengthened by previous research confirming that TPACK helps educators integrate technology effectively into the learning process. Research by Yeh et al. (2021) states that this approach increases student interaction and understanding, improving the overall quality of education. These findings align with the experiences of students who feel that the TPACK approach provides a better understanding of the material and makes learning more exciting and interactive.

In addition, students feel that the TPACK approach provides a systematic and structured framework, making it easier to link technology with learning content and appropriate teaching strategies. Research by Aminah et al. (2020) also supports this view, where they found that integrating technology in teaching through the TPACK framework can improve students' conceptual understanding and applied abilities. In the context of contraceptive counseling, an in-depth knowledge of contraceptive methods taught through interactive technology, such as simulations and video tutorials, can increase students' readiness to provide effective and quality counseling.

Learning Experience with TPACK

Students reported positive experiences during contraceptive counseling learning sessions using the TPACK approach. Technology integration, such as multimedia simulations and online learning platforms, is very helpful in understanding contraceptive counseling material. They feel that technology provides more comprehensive access to various learning resources and allows them to learn independently with more flexibility. One student stated,

"...The use of technology such as multimedia simulations helps me understand contraceptive counseling material. With the existing online platform, I can learn anytime and anywhere..." (Student B)

This finding aligns with research by Nkomo et al. (2021), who found that technology can increase student engagement and provide broader access to learning resources, enabling more in-depth and independent learning. This experience shows that students gain theoretical knowledge and practical skills that can be applied in real situations. Interactive technology, such as multimedia simulations, helps students better assimilate information and practice counseling skills in a controlled environment before facing actual conditions in the field. Furthermore, students report that using technology in learning makes learning more exciting and less tedious.

Research by Priyakanth et al. (2021) supports this view, stating that technology that is effectively integrated into learning can increase student engagement and provide a richer learning experience. In the context of learning contraceptive counseling, technology such as multimedia simulations and online platforms enable students to explore various counseling scenarios, understand various contraceptive methods, and develop the communication skills needed in counseling practice.

Effectiveness of Role Play

Role play is considered very effective in helping students hone contraceptive counseling skills. Students stated that role-play allowed them to practice in situations resembling actual conditions, increasing their self-confidence. After attending the role-play session, most students feel more prepared and confident in conducting counseling.

"...Role play makes me more confident when facing real counseling situations. I feel more prepared and less nervous because I have practiced beforehand..." (Student C)

Role play has proven to be very effective in honing contraceptive counseling skills. Students feel more confident and ready to face real situations after practicing through role play. Research by Dalwood et al. (2020) showed that role play is very effective in health education, as it allows students to practice clinical skills in a safe and controlled environment. Students reported that role-play allowed them to practice various counseling scenarios to develop communication skills and effective counseling techniques. With role-play, they can identify and correct mistakes in their approach and learn how to handle different types of clients and situations that may be encountered in the field. This situation is critical in contraceptive counseling, where the ability to communicate clearly and empathetically can influence clients' decisions regarding the contraceptive method that is most appropriate for them. Apart from that, role play also allows students to get constructive feedback from lecturers and their peers.

This feedback helps students to refine their approach and improve their counseling skills gradually. This process is consistent with practice-based learning, emphasizing the importance of repeated practice and reflection in developing clinical skills. Research by Koukourikos et al. (2021) supports these findings, showing that role play can improve students' clinical skills and confidence in dealing with real situations. In midwifery education, role play provides realistic simulations that help students mentally and emotionally prepare for actual counseling tasks. Apart from improving clinical skills, role play enhances students' ability to work in teams and collaborate with colleagues. They learn to listen and support each other, essential skills in a natural work environment. This collaboration not only increases learning effectiveness but also builds a sense of self-confidence and solidarity among students.

Developed Skills

Learning with the TPACK approach helps students develop various essential skills. In addition to technical knowledge about contraceptive methods, students reported improved communication and empathy skills. They feel better able to listen and provide appropriate advice to clients in counseling situations.

"...In addition to knowledge about contraceptive methods, I also feel like my communication and empathy skills have improved. I learned how to listen and give advice better..." (Student D)

Learning with TPACK helps students develop communication and empathy skills, in addition to technical knowledge about contraceptive methods. Research by Dhar et al. (2021) supports these findings, which found that integrating technology into health education can improve students' communication and social interaction skills, which are essential in health counseling. Students reported that the TPACK approach gave them more profound insight into communicating with clients with diverse backgrounds and needs. Interactive technologies such as multimedia simulations allow them to practice realistic counseling scenarios and get immediate feedback on their communication skills. This approach will enable students to improve client interactions, providing more effective and empathetic counseling.

Furthermore, the use of TPACK helps students understand the importance of empathy in contraceptive counseling. Through simulations and role plays, they learn to listen attentively and provide responses appropriate to the client's needs. This empathy is essential for building good relationships with clients, which can increase the client's comfort and trust in the counselor. Research by Shorey et al. (2020) also shows that technology can teach communication and empathy skills more effectively. In studying contraceptive counseling, technology can provide various tools and resources that help students understand how to interact with clients in multiple situations. For example, video tutorials and interactive case studies allow students to see and analyze examples of good and bad counseling, so they can learn from real situations. The TPACK approach also allows students to learn collaboratively, which can improve their interpersonal communication skills. Group discussions and online collaborative activities enable students to share knowledge and experiences and support

each other in developing counseling skills. This finding aligns with research by Tuma (2021), who found that technology-supported collaborative learning can improve students' communication and cooperation skills.

Benefits and Challenges of TPACK

Students identified several key benefits from learning with the TPACK approach, including increased learning engagement and motivation and broader access to learning materials. However, they also face several challenges, such as limitations in accessing technology and difficulties mastering new technological tools. Students overcome these challenges with help from lecturers and through collaborative learning with classmates.

"...The most noticeable thing about TPACK is that enthusiasm for learning has increased, and the learning material is more easily accessible. However, sometimes the new technology is a bit difficult to use..." (Student E)

Research by Taopan et al. (2020) stated that although TPACK offers many benefits, its successful implementation is highly dependent on technological support and adequate resources. These challenges must be overcome to maximize the effectiveness of TPACK in learning. In the context of contraceptive counseling education, students reported that although the TPACK approach was helpful, they faced several barriers related to access and use of technology. Some students experience difficulties in accessing online learning platforms and multimedia simulation technology, which hinders their learning process. These challenges show that although TPACK has excellent potential to improve the quality of learning, adequate technological support and resources are critical to its success. Successful implementation of TPACK also requires proper training of lecturers and students in using technology.

Students feel that they need more support and training to master new technologies used in learning. Without adequate training, students may not be able to take full advantage of the potential of available technology. This finding aligns with research by Akram et al. (2022), who found that adequate training and technical support were critical to successfully integrating technology in education. In addition, institutional support is also essential to ensure that the necessary technology is available and accessible to all students. Institutions must ensure that adequate technological infrastructure is available and affordable for all students, including stable internet access, adequate hardware, and relevant software to support learning. Research by Istiningsih (2022) also shows that support from educational institutions and policies that support the use of technology in learning are critical factors for the success of TPACK. Institutions must invest in technology and provide the necessary resources to support TPACK implementation effectively.

Readiness to Become a Contraception Counselor

Most students feel better prepared to become contraceptive counselors after the following learning using the TPACK approach. They think they have gained the knowledge and skills needed to deal with various counseling situations in the field. However, several students suggested increasing the practicum aspect so that it is more frequent and intensive.

"...After taking part in learning with TPACK, I feel more prepared to become a contraceptive counselor. However, I hope there are more practicum sessions to strengthen my skills..." (Student F)

Students report that through TPACK, they receive various simulations and case studies that help prepare them for real situations. Interactive learning and role-play give them insight into handling various counseling scenarios with different clients. This finding is significant in contraceptive counseling, where the ability to adapt and provide appropriate information is necessary. Furthermore, technology integrated into learning helps students understand complex concepts better. They can access learning materials anytime and anywhere, which offers flexibility in the learning process. Online learning platforms and interactive modules allow them to review difficult-to-understand material and get immediate feedback. However, some students feel that the frequency and intensity of practicum need to be increased. They believed more practicum sessions would provide more opportunities to hone their skills and increase their confidence in contraceptive counseling. This finding aligns with research by Rourke (2020), which emphasizes the importance of repeated practice and practical experience in developing clinical skills.

Feedback and Suggestions

Students provided several suggestions to improve the effectiveness of the TPACK approach. They suggested improved technical support and access to online learning tools and platforms. They also proposed increasing the number of role-play and simulation sessions to provide more practical experience. Students feel that the technology elements in TPACK are beneficial and should be maintained and further developed in the curriculum.

"...I think technical support needs to be improved, and access to online learning tools should be easier. Additionally, more role play sessions would be helpful..." (Student G)

These findings suggest that the TPACK approach prepares students for their professional roles. Research by Jeffries et al. (2022) supports these findings, indicating that technology in health education can improve students' professional readiness by providing practical and relevant experiences. Students reported that learning with the TPACK approach gave them a deeper understanding of contraceptive counseling and how to apply it in practice. Through multimedia simulations and role plays, they can practice counseling skills in similar situations in the field (Rogers et al., 2022). This approach increases their self-confidence and prepares them to face various situations and challenges that may arise in contraceptive counseling.

In addition, the use of technology in learning allows students to access various relevant resources and information (Haleem et al., 2022), which helps them stay up-to-date with the latest developments in the field of reproductive health. Research by Smith et al. (2020) also shows that technology can provide access to broader and more diverse learning resources, improving students' professional readiness. In the context of contraceptive counseling, access to the latest information about contraceptive methods and best practices is critical to providing quality services to clients. The TPACK approach also helps students develop other vital skills, such as communication and empathy, essential in their professional roles as counselors. With repeated practice through role plays and simulations, they learn how to interact with clients effectively and provide necessary support. Furthermore, students felt the TPACK approach prepared them to collaborate with peers and other health professionals. Working in a team and collaborating is an essential skill in clinical practice, and TPACK-based learning allows them to develop these skills through collaborative activities and group discussions.

Figure 1 illustrates the relationship between the TPACK (Technological, Pedagogical, and Content Knowledge) approach and its impact on improving midwifery students' abilities in contraceptive counseling. The diagram highlights how the integration of technology, pedagogy, and content contributes to a better understanding of the material, which in turn enhances students' counseling skills and boosts their confidence in real-world situations. This structured approach ensures that students are not only equipped with theoretical knowledge but also practical competencies essential for effective counseling.

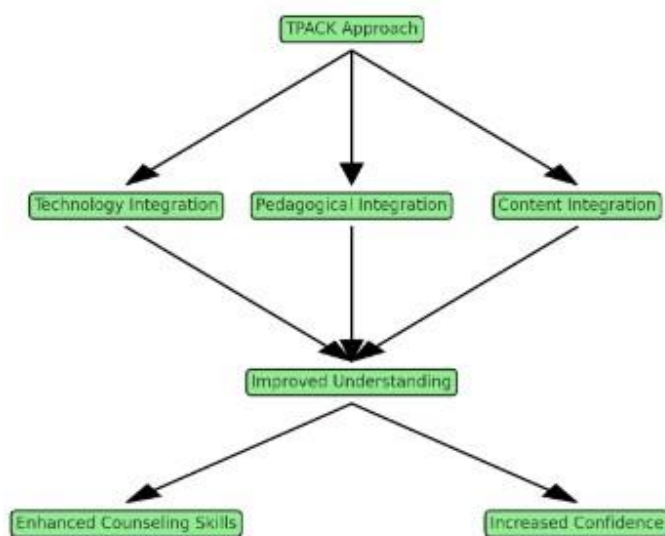


Figure 1. TPACK Approach: Enhancing Midwifery Students' Skills and Confidence in Contraceptive Counseling

The TPACK approach emphasizes the seamless integration of three core elements: technology, pedagogy, and content. In contraceptive counseling training, this integration ensures that midwifery students not only grasp the theoretical aspects of family planning but also learn to apply these concepts effectively using modern tools and techniques. For instance, the use of digital simulations (technology) combined with interactive teaching methods (pedagogy) enables students to engage with the content in a dynamic and meaningful way, leading to deeper understanding and retention.

As shown in Figure 1, the improved understanding facilitated by the TPACK framework directly translates into enhanced counseling skills. Through role play and other active learning strategies, students practice real-life scenarios, refining their ability to communicate effectively and address client concerns. Additionally, this process builds their confidence, preparing them to handle actual counseling sessions with competence and professionalism. Overall, the TPACK approach provides a comprehensive learning experience, bridging the gap between theoretical knowledge and practical application in healthcare education.

Conclusions

The TPACK (Technological, Pedagogical, and Content Knowledge) approach has been proven effective in improving the quality of contraceptive counseling learning for midwifery students. Integrating technology, effective pedagogy, and relevant content provides a more interactive and holistic learning experience. Students reported positive experiences using technology, such as multimedia simulations and online learning platforms, that helped them understand the material better.

This research also shows that role play is a very effective method in honing students' contraceptive counseling skills. Through role-play, students feel more confident and ready to face real counseling situations. In addition, the TPACK approach also helps students develop communication and empathy skills that are important in health counseling. However, this research also identified several challenges, such as limited access to technology and the need for better technical support. Overcoming this challenge requires increasing technological support and continuous development in implementing TPACK in health education. This research contributes value to developing innovative and effective learning methods in health education. Implementing TPACK in contraceptive counseling learning can improve the quality of teaching and prepare midwifery students to become competent and professional counselors in public health practice.

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