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Flipped classroom: Transforming learning about the role of surgery in palliative care in Indonesia

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I. INTRODUCTION

Providing comprehensive palliative care is a global challenge, particularly in resource-limited settings like Indonesia (Putranto et al., 2017). Palliative care education in Indonesia is often underrepresented in medical curricula, leading to gaps in understanding and application among future healthcare professionals. This issue is compounded by the dominance of lecture-based classrooms from elementary to high school in Southeast Asia, including most medical education in Indonesia. Implementing a flipped classroom approach, which reverses traditional lecture-based and promotes active learning, could transform the education of healthcare professionals by effectively integrating surgery and palliative care within the Indonesian context (Hew & Lo, 2018).

The flipped classroom has rapidly developed in recent years, proving effective in medical education by enhancing learning performance and student satisfaction (Hew & Lo, 2018). While widely adopted in parts of Asia, particularly in Taiwan, Korea, and China (Ha et al., 2019), it remains less common in Southeast Asia, especially within medical education.

This study introduces a flipped classroom model to promote active learning and better knowledge retention,

shifting the focus from traditional lecture-based teaching to student-centered learning. We aim to enhance the comprehension and application of palliative care principles among pre-clinical students.

II. METHODS

This study explores the novel use of a flipped classroom method to teach the role of surgery in palliative care, and assessed using the Kirkpatrick model (Heydari et al., 2019). Participants were preclinical students in the palliative care elective module at the School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia.

In the asynchronous stage, students were divided into four groups and given two medical journals and four trigger questions (Supplementary) one week before the synchronous class. They independently studied the material and discussed the questions in groups, submitting their answers to the facilitator a day before the synchronous session. During the synchronous stage, each group had 15 minutes to present their answers, followed by 45 minutes of interactive discussions with the facilitator using case simulations and videos. The facilitator is an experienced educator in palliative surgery.

Kirkpatrick level 1 evaluates student reactions to the learning experience at the end of class sessions using a questionnaire with a Likert scale and open-ended questions on learning materials (journals and trigger questions), learning time, active participation of students, and facilitators. Kirkpatrick level 2 evaluates student learning outcomes through five multiple-choice questions (MCQs). Questionnaires are available in Supplementary. The flipped classroom effectiveness was assessed based on multiple criteria, specifically the student's interest in attending classes, encouragement to

seek additional knowledge sources, active involvement, and motivation to study the material more deeply.

III. RESULTS

Thirty-three out of 37 students who attended the learning agreed to be included in the study. Each group comprises 9 to 10 people with a similar mean GPA (3.21 to 3.33). We assumed identical average GPA scores to mitigate any bias in the study toward students' learning abilities. Table 1 shows students' reactions to the learning experience (Kirkpatrick level 1).

Statement	Mean* ± SD
The flipped classroom method makes me interested in attending classes	4.54 ± 0.56
Flipped classroom makes me want to study the material more deeply	4.84 ± 0.36
The journal provided triggers me to seek other sources of knowledge	4.45 ± 0.83
Trigger questions help me understand the material	4.78 ± 0.48
I am actively involved in the learning process	3.90 ± 1.07
The time given for the learning process is sufficient	4.81 ± 0.46
The instructor facilitates my active participation in class	4.81 ± 0.39

Table 1. Student reactions evaluation (Kirkpatrick level 1) towards the flipped classroom method

*Mean Likert scale
SD = Standard Deviation

Most students spend 1 to 2 hours reading journals (19 students; 57.6%) and discussing in groups (20 students; 60.6%) respectively. Kirkpatrick level 2 evaluation was conducted using five multiple-choice questions administered at the end of the class. The difficulty levels of the questions were assessed, comprising 80% moderate and 20% easy questions. The evaluation results indicated that the average percentage of correct answers was 43.76%, reflecting an unsatisfactory outcome. Specifically, four out of the five questions had correct answer rates below 50%. These results suggest that the learning objectives were not effectively met, highlighting the need for further refinement of the flipped classroom approach and instructional methods to improve comprehension and retention of the material. The data of this study are openly available at <https://doi.org/10.6084/m9.figshare.25594335>.

IV. DISCUSSION

The flipped classroom method increased student interest in attending classes and deepened their study of the material. The learning materials encouraged students to seek additional knowledge, enhancing understanding and active participation. Most students strongly agreed that the trigger questions helped them understand the material and were satisfied with both the time given and the facilitators. However, active participation in the learning process was scored the lowest (3.90 ± 1.07 SD), with some students citing embarrassment, fear, and difficulty expressing opinions. Additionally, group discussions

during the asynchronous stage, which were conducted online, made it difficult for students to unite ideas and draw conclusions from the discussions.

The learning outcome evaluation (Kirkpatrick level 2) revealed that most students answered four of five questions incorrectly, likely due to a lack of clinical experience. Interestingly, question number 2 was the most accurately answered, likely because it aligned with the theoretical principles of palliative learning.

These findings align with other studies demonstrating the flipped classroom enhances medical students' learning outcomes and experiences (Nichat et al., 2023). Nichat et al. (2023) found that the flipped classroom promotes active learning by allowing students to study foundational concepts independently during the asynchronous stage and use class time for interactive discussions and collaborative activities, fostering critical thinking and collective analysis.

The challenges observed, such as the low active participation and difficulties in online group discussions, align with findings from Ha et al. (2019). Ha et al. (2019) highlighting that students in flipped classrooms may initially struggle with active engagement and online collaboration due to a lack of experience and confidence. Providing structured guidance during the asynchronous phase, such as online forums and regular check-ins with

facilitators, could enhance student participation and collaboration.

The need for clinical experience to answer certain questions suggests that incorporating practical, scenario-based learning activities, such as simulations and role-playing exercises, could bridge this gap. This approach can help students apply theoretical knowledge in a clinical context, improving their readiness for practical evaluations (Hew & Lo, 2018; Nichat et al., 2023).

V. CONCLUSION

The flipped classroom method enhances critical thinking, communication, and reasoning skills, leading to higher student satisfaction and engagement. These findings highlight flipped classroom potential impact in Indonesian medical education. Addressing challenges through targeted interventions, such as clinical simulations and improved online collaboration, can further optimise its effectiveness for preclinical students.

Notes on Contributors

Daniel Ardian Soeselo designed the study, reviewed the literature, analysed the data, and gave feedback during manuscript writing.

Rennie Yolanda participated in data analysis and coding of the qualitative data, reviewed the literature, and wrote the manuscript.

Gisella Anastasia, Dwi Jani Juliawati, and Natalia Puspawati reviewed the literature, provided input at all stages of the study, and reviewed the manuscript.

Ethical Approval

This research has received ethical approval from the Research Ethics Commission of the Atma Jaya Catholic University of Indonesia No. 13/10/KEP-FKIKUAJ/2022.

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Declaration of Interest

All authors have no declaration of interest.

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