

Interactive Journal Club: A Learning Method to Enhance Collaboration and Participation among Medical Students

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ABSTRACT

Objectives. This quality improvement study aimed to explore the viability of a learning pedagogy for medical students, the interactive journal club (IJC), in stimulating active learning and engagement among learners. The study intends to explore the benefits provided by the IJC when compared to traditional learning methods (e.g., traditional journal clubs). It attempts to highlight the importance of didactics which focus on active learning and interactive engagement between learners.

Methods. The IJC was implemented as a course requirement in HI 201: Health Informatics, a midyear elective course at the College of Medicine, University of the Philippines Manila. A class of MD-PhD (Molecular Medicine) students was divided into two separate groups: the designated leaders who presented the article and moderated the discussion, and the audience who did not read the article beforehand yet were involved in its critical analysis. The IJC was conducted twice in two different sections of MD-PhD (Molecular Medicine) students, across two different midyear terms, Midyear Term 2021, and Midyear Term 2022. Reflection papers were collected and the responses through this requirement were collated before the primary takeaways were extrapolated. A survey was also sent out to the students of each class to itemize the consolidated feedback of students on the proposed didactic.

Results. The overall process of IJC was deemed both exciting and stimulating. The learning pedagogy provided an alternative platform for active learning, fostering a student-centered approach that placed a heavy emphasis on critical thinking. One major challenge identified in the implementation of the educational design was the heavy reliance on student participation which was identified to, at times, be a difficult factor to overcome. In order to improve its implementation, expectations may be set at the beginning and assessed at the end of the session. In addition, a pre- and post-questionnaire may be given to assess the perceived usefulness of this new method for qualitative comparison.

Conclusion. Interactive and student-centered modes of learning are empirical for the improvement of literature appraisal, journal presentation, and evidence-based critical thinking among medical students. IJCs may be utilized as an alternative and effective learning strategy in teaching pertinent skills expected of a proper physician. When compared to traditional pedagogies, IJCs provide a platform for deeper learning and enable the achievement of learning outcomes, with learner engagement as the focal point. Future attempts at executing IJCs may consider the implementation of learning outcomes setting, and the use of pre- and post-IJC surveys to assess the effectiveness of the modality.

Keywords: education, active learning, critical thinking, interaction



eISSN 2094-9278 (Online)
Published: August 15, 2024
<https://doi.org/10.47895/amp.vi0.7876>

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INTRODUCTION

Historical context of the traditional medical education system

The medical education system affects the overall dynamic of the healthcare system. Higher education institutions such as medical and graduate schools, follow adult learning philosophies and theories by reinforcing the subject's conceptual framework to develop critical thinking and effective communication.^{1,2} In the context of medical education, the strategies utilized must, at all levels, aim to equip learners with clinical competency, professionalism, and active engagement in translational medical research.³ Buja cites that there is a need for changes to the current medical education system to circumvent the risk of producing graduates deficient in clinical competencies expected of an effective healthcare provider. A well-founded understanding of basic biomedical sciences and the pathologic basis of disease is essential to produce physicians with high-level clinical expertise capable of addressing problems in the current healthcare system through evidence-based practice.⁴ Examples of pedagogies being utilized in the current medical educational system include lecture-based plenary sessions, various types of assessments (e.g., quizzes, long exams, presentations), small group discussions, and traditional journal club (TJC) presentations. However, findings from recent studies suggest that medical students often benefit more from educational designs geared towards enabling a more interactive learning experience with instruction tailored towards the student-centered approach.^{4,5}

Learning pedagogies for maximizing learning competencies

A highly robust and versatile medical education system is needed to effectively cater to the needs of medical students of different learning styles.⁴ A learning style can be defined as the ability of an individual to accumulate knowledge in response to different modes of instruction. Busan suggests that for training in a medical education system to be effective, learning strategies must offer both theoretical and practical enrichment, as well as equal opportunities for all students to develop their understanding of the subject matter.⁵ This can be addressed through the implementation of multimodal and integrated problem-based learning approaches to develop strategic learning among medical students.⁶

A framework by Lim et al. posits the importance of cognitive engagement through four primary modalities – interactive, constructive, active, and passive – hence the term, the “ICAP” framework. Various disciplines, such as medicine and other allied medical professional curricula, have adopted problem-based learning, a form of active learning, to achieve and enhance student learning outcomes. From there, more contemporary modalities such as team-based learning have also grown in prominence in the current medical education system, to varying levels of success. To address the limitations

of preceding iterations of active learning, the ICAP framework highlights the importance of allowing students to intrinsically engage themselves with learning materials.⁷ This can be done through flipped learning strategies, which provides learners the develop their own learning competencies independently and through peer-engagement.⁸

Interactive journal clubs

TJCs enable learners to critically appraise medical journals and publications while actively engaging with peers to rapidly generate information about a subject matter.^{9,10} Not only are TJCs considered an established part of the medical education system, many higher education institutions consider TJCs as one of the most practical ways to improve the knowledge content of healthcare practitioners. In a TJC, health practitioners gather to discuss recently published related literature to achieve four major goals – (1) to improve critique skills, (2) keep up-to-date with recently published literature, (3) translate forefront knowledge to guide clinical practice, and (4) maintain good reading habits. While TJCs have the potential of achieving the necessary learning outcomes needed in teaching evidence-based medicine, modifications to the TJC format have been introduced to better cater to the needs of various types of learners across different contexts.¹¹ However, a heavy emphasis is placed on effectively promoting participant engagement to ensure maximized learning and contribution to the discussion.¹² During the COVID-19 pandemic, TJCs shifted to an online platform due to health restrictions and have shown to be successful in accomplishing the goal of providing an avenue for academic discussion.^{9,10} Across other teaching institutions, students have entertained the possibility of conducting student-run online journal clubs, with students serving as moderators or academic mentors.¹³ Belfi et al. and Mark et al. showed that a student-centered approach effectively achieved the goal of actively engaging learners to participate in discussions to help hone critical thinking skills and stimulate an engaging platform for discussion.^{9,10}

Due to the success of TJCs, various medical education institutions have attempted to implement TJC iterations, enabling more active participation among students to better achieve learning outcomes. One such example is the interactive journal club (IJC).¹⁴ IJCs were conceptualized to provide an opportunity for medical students to hone their critical thinking, communication, and active reflection skills while maintaining the basic principles of TJCs. The teaching method fosters the same fundamental principles of active and adult learning by engaging participants to manipulate and apply knowledge for a deeper learning experience. The assimilation of clinical knowledge, skills, and attitudes is more effectively addressed through IJCs by providing a less passive way to develop learning competencies. Moreover, implementing IJCs requires minimal training and resources, highlighting the convenience of this technique over other more traditional forms of teaching.²

In an attempt to validate the viability of IJCs as an alternative pedagogy in medical education, the technique was employed in two different health informatics classes, each composed of a different set of MD-PhD (Molecular Medicine) students. Feedback from students of each group were gathered to identify the potential utility of IJCs in medical education, while identifying focal points that need to be addressed or emphasized if integrated into a curriculum. Given the exploratory nature of the learning modality, the researchers acknowledge the intrinsic bias evident in the way the study was conducted. However, future IJC iterations in other teaching contexts could attempt to test the robustness of the pedagogy on a larger scale for more widespread use.

Current learning strategies rely on passive, traditional modes of learning to impart learning outcomes expected of a clinician. To address the need for the development of educational didactics geared towards maximizing learning competencies through active, peer-engagement, the IJC is proposed as a learning modality in the current medical curriculum.

OBJECTIVES

The purpose of this study is to introduce the IJC as a possible learning strategy for medical students. The study attempts to explore the possible benefits of adopting an active mode of learning in the current medical curriculum, by integrating the importance of interaction, collaboration, and peer-engagement through a learner-driven approach. To this, the study attempts to achieve the following specific objectives: (1) to assess the overall effectiveness of the IJC and (2) to identify the advantages and disadvantages of IJCs compared to traditional modes of learning (e.g., TJs), and (3) to reinforce the importance of active learning and critical thinking in medical education.

METHODS

Quality improvement initiative criteria

The study adopted the format of a quality improvement initiative for medical education. In accordance with the Standards for Quality Improvement Reporting Excellence in Education (SQUIRE-EDU), the criteria listed in the guidelines were strictly adhered to.¹⁵

Interactive Journal Club format

An IJC consists of two phases – (1) the preparation and (2) the presentation steps. Before the first phase, the class is divided into two groups – one composed of the presenters and another consisting of the audience. Presenters are given the opportunity to learn and study the assigned journal article. Students assigned to the audience will only learn about the article through the report of the presenters, allowing the development of listening skills and engagement during the discussion. During the preparation phase, students

belonging to the presenters group select a topic, peruse, and appraise the journal, assign designated leaders (DLs) who will discuss specific sections of the assigned journal and moderate discussions among the class, and prepare the slides to be presented during the IJC session. In contrast, the presentation step takes place during the IJC session proper. During this phase, the discussion is structurally sequenced to follow a group analysis and DL discussion of the title, followed by the procedure or methodology, then the results presented in the assigned journal article. At the end of the presentation phase, key concepts in the discussion are summarized and the title is revisited and discussed to reinforce the main points raised about the journal article.

Assessment of the IJC as a learning strategy

To determine the viability of IJCs as an alternative medical education pedagogy, two different HI 201: Health Informatics classes comprised of different sets of MD-PhD (Molecular Medicine) students enrolled in the College of Medicine, University of the Philippines Manila implemented an IJC as one of the course requirements. Students in the class were divided into presenters and audience members. The sections of the activity were distributed and mediated by the assigned presenters. The sections divided among the DLs of the presenters consisted of (1) the analysis and discussion of the title and methodology, (2) the presentation and analysis of data and figures, and (3) the summary, limitations, and revisiting of the title (Figure 1). Prior to the conduct of the IJC, all participating students were assumed to have an idea of the IJC format.¹⁵

This study was conducted in Midyear Term 2021 and Midyear Term 2022, across two different sections of HI 201: Health Informatics classes. The students enrolled in each section consisted of six different MD-PhD (Molecular Medicine) students each. All students who participated in each IJC were asked to provide their feedback through a reflection paper submitted after the activity. A survey was also sent out to each student after submission of the reflection paper to itemize their feedback on the activity. Only 11 of the 12 students responded, with 1 student being responsible for compiling the responses of all respondents. The collected feedback from both the reflection papers and the survey responses was collated and anonymized prior to being assessed. Significant difference of overall satisfactory ratings was determined via Kruskal-Wallis Test ($p = 0.05$) using SPSS v26.

Ethical Considerations

This study was a QI activity and not human subject research. Therefore, review and approval by the local institutional review board were not required. The participants and facilitators of the IJC, which consisted of students enrolled in two sections of the HI 201: Health Informatics midyear course and the course professor, also served as the authors of the study.

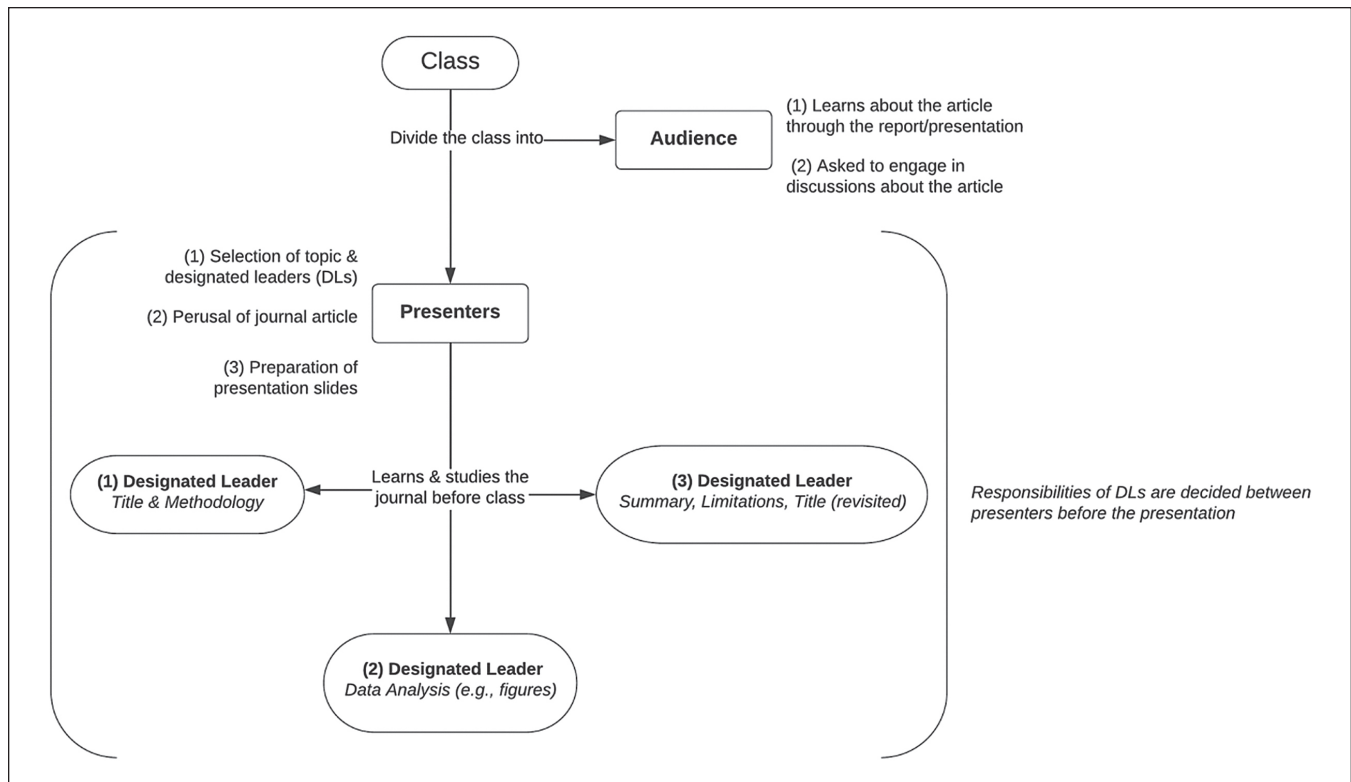


Figure 1. Proposed schematic flow for the steps in conducting an interactive journal club (IJC). The roles and assigned tasks of each designated leader of the presenter group shall be decided among members of the group during the preparation phase.

Limitations of the Study

This study is limited by the small sample size and the constraints posed by the midyear course set-up. Since HI 201: Health Informatics has only been offered twice, there is a limited number of respondents who have experienced the IJC format. Since the authors of the study also served as the participants of the activity, there is also some degree of bias in the perceived viability of the didactic. Finally, the didactic was only utilized in the context of teaching health informatics, and was not utilized in the context of other basic sciences and clinical sciences disciplines.

RESULTS

Preparation for the IJC

Generally, the reception of the student participants involved in the IJC was positive – highlighting the engaging and immersive environment for academic discussion provided by the learning strategy. Compared to a TJC, IJCs are student-centered and not teacher-centered. The designation of roles was done among members of the class, whether as a DL, a facilitator, or a member of the audience. A key prerequisite to ensure the success of the IJC is that all members of the class, regardless of the role given, must have prior knowledge of the IJC process prior to coming into the discussion. A proper understanding of each role is

essential to ensure a coherent flow for discussion during the IJC. Moreover, audience members, although not given access to the journal until the day of the IJC session, are allowed to hypothesize and anticipate probable topics or concepts that will be brought up for discussion.

IJC Proper

During the IJC discussion proper, audience members are constantly engaged in the discussion and are not relegated to passive listeners. Presenters are to ask several structured questions based on the outline of the discussion prepared for the journal club. However, the lack of a thorough assessment of the methodology and results of the research study being discussed presented a challenge in the enrichment of participants' insights through active discourse. It was evident that there was a lack of a review of specific and relevant terminologies, and statistical tools used in the discussion of the study, which should be given more emphasis in future iterations of IJCs. Given the reliance on audience engagement, presenters noted that the overall effectiveness of the IJC could have been improved through active questioning from the participants to supplement the DLs discussion. This could have also served as a platform for clarification of background knowledge and fundamental concepts about the topic, while allowing for the augmentation of investigative techniques and critical thinking skills. One final notable

benefit attributed to the IJC format was the emphasis on teamwork and collaboration, for both the presenters and the audience members. Although present in other learning modalities, this was further reinforced in the IJC, given the online platform utilized as a result of the COVID-19 pandemic.

Feedback on the IJC

A total of 11 students were surveyed for their feedback on their experiences from the IJC, six from the Midyear 2021 HI 201 section and five from the Midyear 2022 HI 201 section. No significant differences were noted in the responses across each section ($p = 0.67$). Table 1 shows the summarized results of the self-assessment of each student on the overall effectiveness of the IJC as a learning modality. Participants reported that the IJC was a highly effective learning pedagogy for medical students ($\mu = 7.91$; $SD = 1.76$). When compared to traditional journal clubs (TJCs), participants mentioned that the IJC enabled better understanding of the learning contents of the course ($\mu = 8.00$; $SD = 2.05$), and more effective application of knowledge ($\mu = 7.91$; $SD = 1.70$) and learning of concepts ($\mu = 7.73$; $SD = 1.68$). Several advantages and disadvantages were also cited

by the participants through the reflection papers submitted, with majority citing audience participation ($n = 7$) and peer mentorship ($n = 9$) being a distinctive advantage in favor of IJCs, and heavy reliance on the reporters' mastery over the assigned journal ($n = 8$) and capacity to deliver an engaging report being major risks for the overall effectiveness of the learning strategy (Table 2). Participants also reported enhanced learning performance due to the IJC ($\mu = 7.73$; $SD = 2.00$). In terms of recommending the IJC's inclusion in the medical curriculum, the majority of the participants supported its inclusion ($\mu = 8.09$; $SD = 1.51$). However, in terms of suitability to different learning styles, some participants reported that the added role played by listeners in the IJC may not be compatible with all types of learners ($\mu = 7.09$; $SD = 2.26$). Overall, the participants reported an overall satisfaction with their experience with the IJC ($\mu = 8.18$; $SD = 1.17$, $p = 0.433$) (Table 1).

DISCUSSION

IJCs provide an alternative to the typical educational pedagogies being utilized in the medical education system. The student-centered nature of the learning pedagogy

Table 1. Participants' Self-assessment of the Overall Effectiveness of the IJC and its Viability as a Learning Pedagogy in Medical Education

| Item | Mean (μ) | SD |
|--|----------------|------|
| <i>In my opinion, the Interactive Journal Club is an effective learning pedagogy for medical students.</i> | 7.91 | 1.76 |
| <i>In my opinion, the use of the Interactive Journal Club enables me to understand learning contents.</i> | 8.00 | 2.05 |
| <i>In my opinion, the use of the Interactive Journal Club enables me to apply knowledge.</i> | 7.91 | 1.70 |
| <i>In my opinion, the use of the Interactive Journal Club enables me to learn concepts easily.</i> | 7.73 | 1.68 |
| <i>In my opinion, the use of the Interactive Journal Club enhances my learning performance.</i> | 7.73 | 2.00 |
| <i>I would highly suggest the inclusion of the Interactive Journal Club in the current medical curriculum.</i> | 8.09 | 1.51 |
| <i>The Interactive Journal Club format suited my style of learning.</i> | 7.09 | 2.26 |
| <i>Overall, I am satisfied with my experience participating in the Interactive Journal Club.</i> | 8.18 | 1.17 |

Interpretation: 1 corresponds to "Strongly Disagree" whereas 10 corresponds to "Strongly Agree".

Table 2. Comparison of the advantages and disadvantages of interactive (IJCs) and traditional journal clubs (TJCs)

| Pedagogy | Advantages | Disadvantages |
|---------------------------------------|---|---|
| Interactive Journal Club (IJC) | <ul style="list-style-type: none"> Presenters are expected to have good mastery over the assigned journal ($n = 8$) Audience members are engaged throughout the duration of the process ($n = 7$) Audience members are given the opportunity to critically evaluate and appraise the article ($n = 8$) Student facilitators enable peer mentorship during discussions ($n = 9$) | <ul style="list-style-type: none"> Insights cited from audience members must align with the presenters ($n = 5$) Presenters must come up with effective ways to engage and stimulate audience members ($n = 8$) Summaries and recaps of insights are essential to ground discussions ($n = 2$) Audience members are limited in their access to the author's original ideas ($n = 3$) The participation of faculty facilitators is limited to post-discussion evaluation ($n = 2$) |
| Traditional Journal Club (TJC) | <ul style="list-style-type: none"> Reporters are expected to have good mastery over the assigned journal ($n = 5$) All participants are given access to the author's original ideas ($n = 10$) Faculty facilitators are present, guide discussions and direct ideas to the expected learning outcomes ($n = 8$) | <ul style="list-style-type: none"> Passive listening on the side of audience members ($n = 10$) The effectiveness of the discussion is reliant on the ability of the reporter ($n = 6$) Only the critical thinking and communication skills of the reporter is primarily honed ($n = 1$) |

maximized interactions among peers, enabling improved journal perusal and communication skills while heightening critical thinking.¹⁶ The unique approach to literature appraisal and article perusal provided a fluid form of adult learning that entails bidirectional discourse to arrive at a consensus on the focal points of the article being discussed. DLs are expected to direct the flow of the discussion toward the key concepts that need to be highlighted while keeping members of the audience actively engaged in the group analysis. This entails both ample preparation and planning to ensure coherence in the flow of the IJC – requiring both a synthesis of the article and a concise dissection of pertinent concepts. Preparation for the IJC includes the construction and utilization of focused questions to guide the discussion, thereby allowing a systematic evaluation and review of the author's work. Although viable in the context of the IJC, another study explored the removal of the necessity for ample preparation and demonstrated a generally positive experience for learners.¹⁷ On the side of the members of the audience, active listening, engagement, and sharing of thoughts based on the directions of the presenters are essential to grasp the ideas being discussed. Compared to TJCs, IJCs are reliant on the active involvement of the participants in the analysis of data instead of the typical passive listening of a peer's report of an author's work. This disparity addressed by IJCs maximizes the opportunity for the development of critical thinking, active reflection, and personal confidence. These findings were also demonstrated in previous studies which attempted to pilot learning pedagogies with similar formats to the IJC.^{10,13}

Although the entire process of the IJC presented an engaging yet learning-centered avenue for discussion, a distinctive challenge that needs to be addressed lies in the interpretation of data and the ability to arrive at a consensus to reach the ensuing goal of the IJC. Audience members are expected to give their complete and concrete thoughts on the data which requires absolute attention and awareness throughout the duration of the activity. This added role, however, may not be suitable for all learners, as highlighted by the results of the survey conducted among participants of the IJC (Table 1). Presenters, meanwhile, are expected to provide enough contextual clues and relevant information to help members of the audience to frame their own interpretations of the article being discussed. During discussions, an important feature provided by IJCs is the opportunity for the audience to synergize and stimulate peer mentorship to arrive at a proper consensus throughout the process. The idea of peer mentorship is a prominent aspect of effective adult learning that enables a strong collaborative learning experience.³ In the IJC, this is highlighted in the ability of the participants to tactfully extrapolate the findings of the study and evaluate the overall strengths and weaknesses of the research design followed. Previous studies also show that this strategy for collaboration in the journal club design also worked effectively through a virtual platform.¹⁸ This

requires the application of previous knowledge in research by the audience. Sharing of their individual understanding of the data presented challenges the group's individual perceptions on the study. This gives them the opportunity to integrate their existing knowledge with new concepts, thereby improving their expertise in designing studies, analyzing data, and presenting them. However, this could only have been achieved through perceptive correction or supplementation on the side of the presenters. By this notion, the importance of the two-way communication aspect of the IJC is reinforced, thus expanding the group's knowledge and expertise in research, as well as enabling an exhaustive analysis and in-depth dissection of the article discussed, without preconceived prejudice or bias. Finally, given the circumstances of the study, being inadvertently conducted during the COVID-19 pandemic, the effect of the IJC and student-centered educational designs on reducing the negative impact of the pandemic on medical education was reinforced in this study.¹³ Future studies that attempt to investigate other learning strategies in medical education must consider the versatility of the modality, with the current shift to blended learning being implemented across the country.

The rise in prominence of new learning modalities as the IJC in the current medical education landscape highlights key factors noted in previous attempts at introducing novel learning pedagogies – the importance of the inclusion of students in the design of a curriculum.¹⁹ The primary focal point for stakeholders in the current medical educational system should be to reconcile the faculty's expectations of being able to teach learners critical literature appraisal techniques and the students' requirement for engagement.¹⁷ To this, the implementation of new learning strategies that consolidate the needs of both educators and learners must be explored further.

CONCLUSION

As medical education continues to evolve, interactive and student-centered modes of learning allow for the presentation of new information and critical appraisal of data on different research findings relevant to the said field or the reinforcement of evidence-based medical practice. Thus, IJCs may be considered as a viable learning strategy in medical and graduate school education. Compared to TJCs, IJCs offer several benefits such as effective engagement and better achievement of learning outcomes through a student-centered approach, when compared to a passive, teacher-centered approach (Table 2). The integration of IJCs into the curriculum enables enhanced individual learning and peer engagement within the classroom. The advantages posed by IJCs outweigh those which are perceived to be provided by existing tools available in the current medical education system. The pedagogy also reinforces the need to reestablish the role of academic faculty mentors as catalysts

for instilling motivation and a mindset geared for continued learning.² Future iterations of IJCs can consider setting expectations prior to the presentation to assess if these were met during the session. For a qualitative comparison, a pre- and post-questionnaire may be administered to assess the perceived usefulness of the IJC, apart from the submission of a reflection paper.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

All authors declared no conflicts of interest.

Funding Source

None.

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