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LEARNING MEDIA REVIEW

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Exploring the Utility of Trello – an Alternative Learning Management System in Facilitating Problem-Based Learning in Medical Education

Elisa Nugraha Haryadi Salakay[1,3*], Saurabh RamBihariLal Shrivastava[2,3]
[1]Medical Education Unit, Faculty of Medicine Cenderawasih University, Jayapura – INDONESIA
[2]Department of Community Medicine, Datta Meghe Medical College, Datta Meghe Institute of Higher Education and Research, Nagpur, Maharashtra – INDIA
[3]Master Program in Medical and Health Professions Education, Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, Yogyakarta – INDONESIA

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ABSTRACT

Background: The increasing utilization of technology in medical education calls for innovative learning media that can effectively support teaching and learning processes. Exploring alternative Learning Management System (LMS) options is necessary because some LMSs have cost customization and usability limitations.
Aim: This review explores the potential utility of Trello, an alternative LMS, as a tool for facilitating Problem-Based Learning (PBL) in medical education.
Learning Media Review: Trello, a flexible and user-friendly LMS based on Kanban, provides features like boards, lists, and cards that users can customize to create tutorial learning processes. Trello facilitates student-centered learning, collaboration, active learning, communication, and critical thinking, all essential principles in PBL. It enables synchronous and asynchronous learning sessions, allows tutors to monitor and interact with students, and provides centralized organization and tracking of tasks and progress.
Conclusion: Trello demonstrates excellent potential as an alternative LMS in medical education. Its adaptable features, seamless integration with various technologies, and user-friendly interface make it an engaging platform for educators and learners. Trello effectively supports the implementation of PBL tutorials, mainly using the Seven Jump method. However, we should consider user training, accessibility, and inclusivity. Further research is recommended to explore assessment methods, enhance student engagement, and assess long-term implementation and sustainability.

Keywords: Trello, learning management system, medical education, problem-based learning

PRACTICE POINTS

- Educators should consider utilizing Trello as an alternative LMS in medical education.
- When implementing Trello as an alternative LMS, educators should provide user training and support to ensure the effective utilization of its features.
- To maximize the benefits of using Trello as an alternative LMS in PBL tutorials, educators should ensure accessibility and inclusivity for all learners, conduct comparative studies to evaluate its effectiveness compared to other LMS options, and gather feedback from students and faculty to continually improve and refine its implementation.

*corresponding author, contact: elisa.fkuncen@gmail.com

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INTRODUCTION

The utilization of technology is increasing in the teaching and learning process in medical education. The success of technology utilization in medical education depends on the ability of learners and educators to utilize various available learning media.[1] Technology utilization is advantageous, but challenges were continuously developing medical education. However, technology utilization only partially replaces previous learning methods.[2] In developing media for distance learning, medical education requires innovative learning media.[3,4] One example of technology that can be used in distance learning is the Learning Management System (LMS). A Learning Management System is a system used to facilitate the online teaching and learning process. Learning Management System allows educators to create, manage, and disseminate learning materials, manage tasks, and monitor learners' progress online. In addition, LMS also provides features such as class scheduling, discussion forums, and online interaction between educators and learners.

Currently, many LMSs have been developed and widely used. Hundreds of LMSs are available for educational use and purposes, some commonly used as learning platforms in higher education institutions such as Moodle, Blackboard, Edmodo, Canvas, and others.[5] So far, Moodle is the most widely used LMS because it is open-source, flexible, accessible, and has many supporting features for the learning process.[6–9] But because of LMS drawbacks such as maintenance, lack of flexibility, installation expense, and user-friendliness—particularly for those who need to be more tech-savvy—careful selection is required, considering the institution's needs and available resources.[10–13] Flexibility for customization, interaction with other technologies, usability, accessibility, and strong technical support are essential requirements for an appropriate learning management system (LMS), as these elements substantially impact the efficacy and efficiency of the teaching and learning process.[14]

In this context, Trello emerges as an innovative alternative LMS, known more for its prowess in task and project management.[15] Because Trello has unique characteristics that meet PBL requirements, this review suggests it to be an effective platform for PBL training.

All users can utilize Trello, including those not typically tech-inclined, because of its user-friendly interface. A dynamic, captivating PBL environment that is customized to fit various instructional circumstances is made possible by its flexibility and adaptability. Trello is a complete resource access, communication, and collaboration platform that becomes even more useful when integrated with other technologies. Trello's affordability and multi-device compatibility also provide an economical yet effective teaching tool for organizations looking for a workable alternative.

Empirical data from research and case studies support Trello's efficacy in learning environments.[16–19] This review explores the potential of Trello as an alternative learning management system (LMS), particularly for supporting PBL tutorials in medical education. This is accomplished by providing a new perspective on the function of technology in changing educational environments.

LEARNING MEDIA DESCRIPTION

Trello is based on the Kanban method, which translates to “card” or “sign” in Japanese and is the term given to inventory control cards.[20] Trello is a simple project management application with main features in boards, lists, and cards that allow organizing specific tasks, projects, or specific learning management.[15] Trello has flexible features, such as adding members to each task or project, comments, attachments, checklists, and color labels that can be adjusted to suit user needs.[14,21] Trello can also be easily accessed via mobile and web apps, making it easy for users to access and organize tasks and projects from anywhere and at any time.[15,22] The features in Trello, such as boards, lists, cards, and various add-ons, make it easier for users to develop and create tutorial learning processes according to user needs, such as case presentations, board creation, giving assignments and discussions, tracking progress, resource sharing, evaluation and monitoring from tutor to student progress task or discussions.[15,16,22] Figure 1 shows the interface of Trello, a project management application rooted in the Kanban

method, and its application in an academic setting. The image highlights Trello board features, organized in educational workspaces focused on neurology and psychiatry, marked with labels such as "Neurologic Disorders Block" and "Psychiatric Disorders Block." These boards are grouped into Problem-Based Learning (PBL) groups, numbered according to the group, and decorated with template images that can be arranged and adapted to the required learning theme. Trello is expected to facilitate several main learning principles in PBL, such as student-centered learning, active learning, collaboration, communication, and critical thinking.[16,18,23,24]

In the tutorial steps, students will be immediately directed to discuss each list made according to each step of the seven-jump method. (Figure 2) shows the Trello interface with lists corresponding to the stages of the seven-jumps method, which is part of the PBL approach. In this list, students in each group are asked to collaborate and complete assigned case scenarios relevant to each learning process step. Tutors can observe and interact with students as their discussions progress. The interface highlights tools such as labels, checklists, due dates, attachments, and enhancements for automation, which are essential for facilitating tutorial organization and discussion flow. The advantage of Trello for tutorials is that it allows tutors to maintain interaction with students and monitor their learning activities, including during asynchronous stages such as self-study. Students can utilize the list feature to share resources and continue their discussions.

(Figure 3) shows the Trello board during self-study, highlighting how it facilitates asynchronous learning. The interface includes lists where students post and organize their independent research findings, using tools like labels, checklists, due dates, attachments, and automation enhancements to structure their work. This stage of the PBL tutorial is crucial, as it encourages students to delve deeply into the subject matter, allowing them to gather and share information, pose questions, and engage in discussions; additionally, facilitators have interactive capabilities to supervise and communicate with students. Through features like comments, notifications, and checklists, facilitators can provide immediate feedback, monitor progress, and ensure adequate comprehension of concepts. Trello accommodates synchronous and asynchronous sessions in PBL tutorials as an alternative LMS. The downside, however, is that access to all of its functionality requires a paid subscription, and it limits group interactions to written exchanges via discussion boards and comment sections.

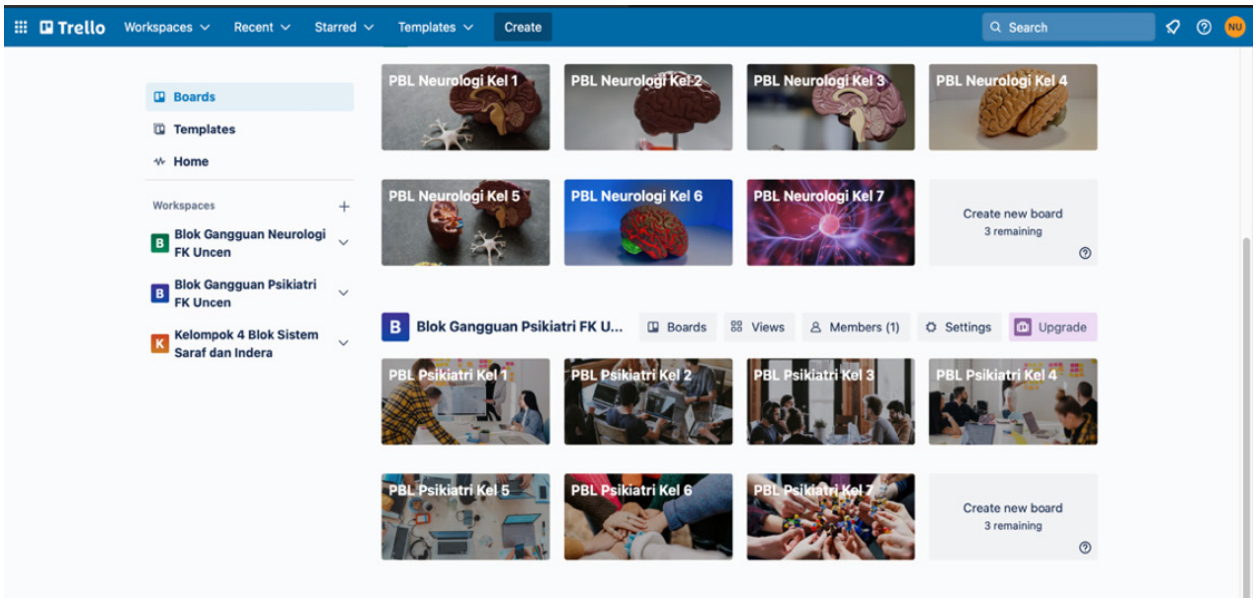

Figure 1. The Board Features in Trello are Built based on the Division of PBL Groups

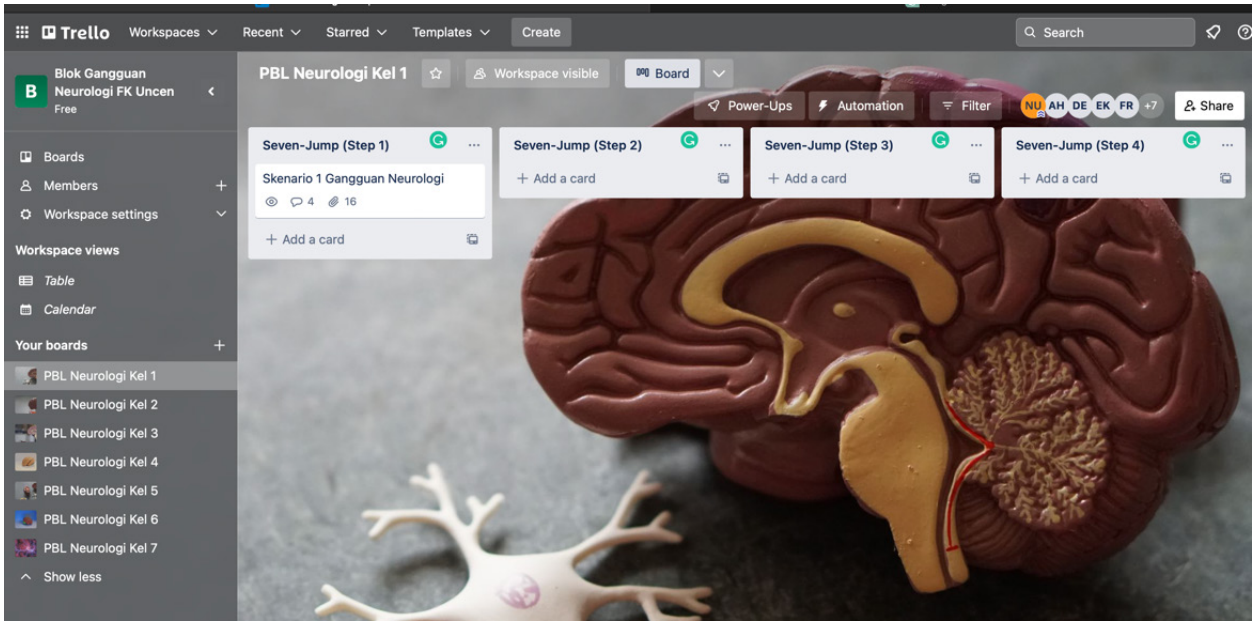

Figure 2. Additional Trello Features in the PBL Tutorial

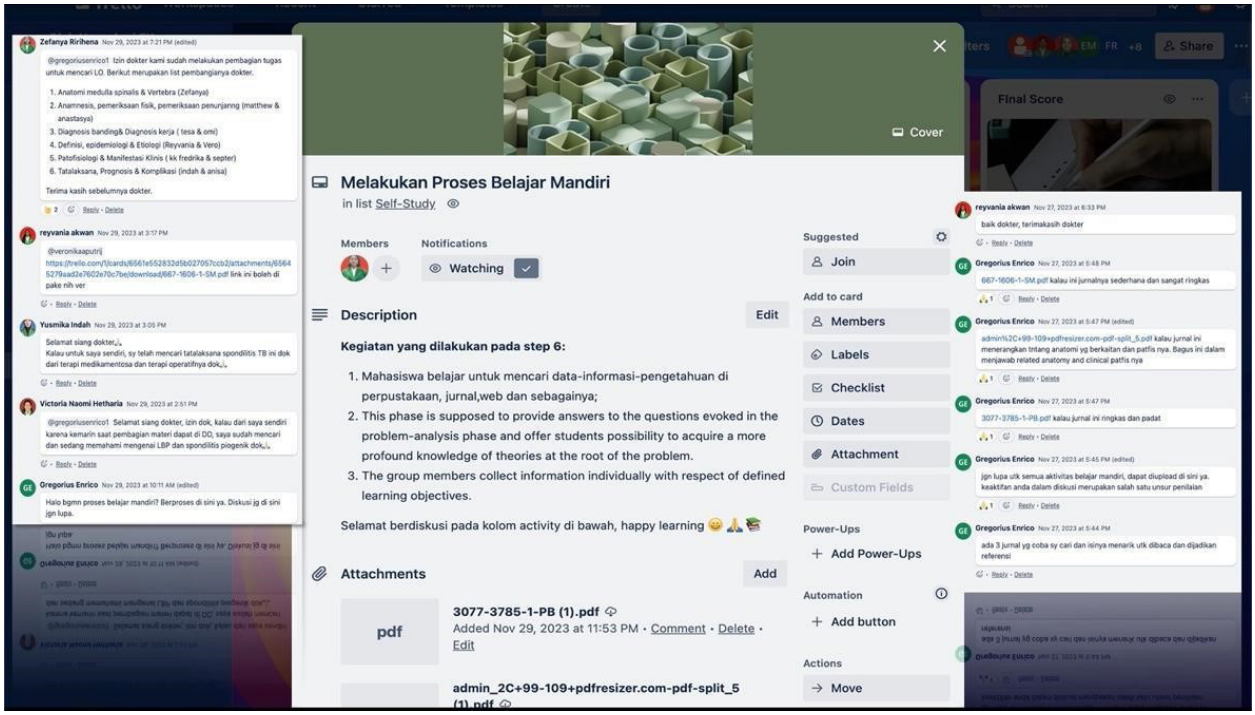

Figure 3. Trello Board for Self-Study Phase in PBL Tutorial

DISCUSSION

Trello, better known as a company project management tool, is also valuable for education.[16] Blurs the lines between learning management systems (LMS) and project management systems. Although other fields commonly use Trello for project organization, its features are also suitable for educational purposes.[16,18,25] Trello offers features

such as a notification panel, calendar, comment space, and file management, which are very helpful for teachers.[15] These features make the learning process more interactive and facilitate students' collaboration and understanding of learning material.

Education today relies heavily on technology and often requires systems tailored to learning needs.[3] Users can use Trello for free, while users can use the paid version for more comprehensive and maximum access to features.[29] This benefits educational institutions with limited budgets who want to use technology. Trello meets this need by allowing teachers to customize teaching materials and share them easily, making it a good choice for an unconventional LMS.[30] Besides its features, Trello's adaptability makes it attractive as an LMS. Therefore, although Trello is not a typical learning management system, its features and flexibility make it a practical option, especially when standard LMS systems still need to meet the needs fully.

Furthermore, Trello's seamless integration and operation with in-classroom curriculum allow educators to provide sequential integrated learning experiences that assist students through the material. Training users on how to use task management software like Trello as an LMS is crucial. Research supports this concept as development teams can benefit from digital, agile task management tools like Trello.[31] Trello is a practical framework for conducting PBL tutorials using the Seven Jump method. A dedicated Trello board is created for the tutorial, with each block group having a corresponding title. The board is a centralized hub for organizing and tracking the Seven Jump steps and related tasks. Lists are created for each step in the Seven Jump process, providing a clear structure and visual representation of the stages involved. Cards within each step list capture individual tasks or discussion activities, ensuring tasks are well-defined and assigned to participants. Trello's features, like labels, due dates, and checklists, enhance task management, allowing participants to prioritize and set task deadlines while breaking them down into detailed steps.[15]

Collaboration and communication are seamlessly facilitated through Trello.[21] Participants are invited to join the board as members who can add comments, engage in discussions, and exchange information within cards. The mentioned feature enables directed communication, making it easy to involve specific individuals in discussions. Attachments can be added to cards, providing a centralized location for sharing relevant files, images, or documents. As participants progress through the tutorial, they can move cards to the following list, visually representing the progress of the discussion process. Collaborative work is encouraged by adding members to relevant cards, allowing team members to collaborate, provide comments, and upload files. Trello's due date feature and Power-Ups further enhance task management and functionality, ensuring that participants stay on track and have access to additional tools if needed.[15,21]

Additional discussions or meetings can be organized using specific cards, where details like time, location, and agendas can be added.[15] Participants can confirm attendance and comment on the meetings, fostering a collaborative environment. The Trello board serves as a valuable tool for tracking and monitoring progress. The block coordinator and facilitators can regularly review cards, checklists, comments, and attachments, providing necessary feedback and guidance to ensure the tutorial's smooth progression. In summary, Trello streamlines organization, communication, and monitoring within PBL tutorials, enabling effective implementation of the Seven Jump method.

Trello should be preferred because it is easy to use, and even new users can learn to use it promptly. Moreover, it is a flexible option wherein users can collaborate for different purposes. There are features to provide real-time updates and comments on various aspects. Further, Trello has a feature that we can integrate with different other applications, and thus, work can be streamlined. Finally, the visual nature of Trello makes it quite convenient for users to take stock of the pending activities at a glance.

In summary, as listed in the table below, some potential and challenges come from using Trello as an LMS for tutorial PBL.

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Table 1. Potentials and challenges of Trello for Tutorial PBL

Potentials	Challenges
Efficient organization and task management: Trello's boards, lists, and cards enable easy organization of PBL tutorials, allowing users to track progress and manage tasks effectively.	Limited communication options: Trello primarily relies on written communication, which may hinder rich interactive discussions and real-time user collaboration.
Flexibility and adaptability: Trello's customizable features, such as labels, due dates, and checklists, provide flexibility to tailor the learning process according to the specific needs of medical education.	Limited multimedia integration: Trello focuses primarily on task management, so incorporating multimedia content, such as videos or interactive simulations, may be challenging within the platform.
Collaborative learning environment: Trello's features, like comments, attachments, and team collaboration, facilitate effective communication and collaboration among participants, promoting active learning in PBL tutorials.	Cost and access to advanced features: While Trello offers a free version, access to advanced features and functionality often requires a paid subscription, which may pose financial constraints for institutions or users seeking more comprehensive LMS capabilities.

CONCLUSIONS

Trello, a versatile project management application, can be effectively utilized as an alternative LMS in medical education. With its flexible features and user-friendly interface, Trello offers a range of tools and functionalities that can enhance the teaching and learning process. Educators can organize and track assignments, projects, and specific learning management tasks by leveraging Trello's boards, lists, and cards. Trello's integration with various technologies enables seamless communication, collaboration, and resource sharing among students and educators. The platform's adaptability and customizable content options make it well-suited for creating interactive and engaging learning environments. Additionally, Trello's suitability for conducting PBL tutorials, particularly utilizing the Seven Jump method, further demonstrates its efficacy as an alternative LMS. Overall, Trello's features, adaptability, and facilitation of organization, communication, and monitoring make it a compelling choice for medical educators seeking an innovative and efficient learning management solution.

RECOMMENDATIONS

Further practice and research recommendations for the use of Trello as an alternative LMS in PBL tutorials include providing user training and support, integrating multimedia elements, exploring assessment methods, promoting collaborative learning, ensuring accessibility and inclusivity, conducting comparative studies, examining long-term implementation and sustainability, exploring pedagogical strategies, enhancing student engagement and motivation, and collecting feedback for iterative improvement. Future studies are needed to better understand Trello's potential as an effective LMS in medical education, particularly in supporting PBL tutorials.

COMPETING INTEREST

The authors acknowledge no conflicts of interest regarding the topics or resources used in this manuscript.

AUTHORS' CONTRIBUTION

Elisa Nugraha Haryadi Salakay – compiled most of the draft manuscripts, edited and reviewed manuscripts, conducted the literature review.

Saurabh RamBihariLal Shrivastava – edited and reviewed the manuscript.

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