

1 Short communication

Title:

Artificial Intelligence in team-based medical education: evaluating different Chat GPT versions on an evidence-based medicine assessment.

Authors

Deonna Ackermann, Fiona Blyth (The University of Sydney)
deonna.ackermann@sydney.edu.au

Background:

Rapid Evidence for Practice (REP) modules were adapted from the Team-Based Learning (TBL) framework to deliver evidence-based medicine (EBM) education for medical students. These modules engage students in collaborative, case-based activities where they apply EBM skills to clinical scenarios and perform critical appraisal tasks as part of their assessments. With the growing use of artificial intelligence (AI) by students, this study reports the performance of Chat GPT versions 3.5 and 4.0 in completing these EBM critical appraisal tasks.

Methods:

Second-year graduate medical students participated in a REP module focussed on randomised controlled trials which incorporated online learning resources, individual readiness quizzes, a forum demonstrating critical appraisal, and a team-based rapid appraisal assessment task. Chat GPT versions 3.5 (February 2023, reference and link to article provided) and 4.0 (December 2023, full article in pdf format uploaded) were evaluated on their ability to complete the same tasks, with performance measured against a standard rubric.

Results:

Chat GPT 3.5 excelled in communicating research results, scoring above standard. However, it was below standard in formulating clinical and research questions using the PICO format, assessing risk of bias, and summarising and applying results. This version displayed a tendency towards general responses, inaccuracies ('hallucinations'), and particularly struggled with queries related to risk of bias. Chat GPT 4.0 displayed significant improvement, achieving above-standard scores in all rubric domains. For both versions, notable issues included the use of American spelling, exaggerated language, and instances of responses contrary to the specific instructions given to students.

Conclusion:

The proficiency of AI like Chat GPT, especially in its more advanced iterations, presents a challenge for medical educators in distinguishing between student-generated work and AI-assisted submissions. This underscores the need for more nuanced assessment methods to ensure authenticity.

2 Short communication

Title:

Team-Based Learning in Nursing Education: A Scoping Review of Reported Elements

Authors

Julie Considine, Joshua Allen, Nicky Hewitt, Elizabeth Oldland, Stephanie K. Sprogis, Judy Currey
(Deakin University)
julie.considine@deakin.edu.au

Background:

The most commonly reported Team-Based Learning (TBL) outcomes are i) knowledge, ii) learner perceptions, satisfaction with, or experiences, of TBL, iii) learner engagement and attitudes toward TBL, and iv) team performance. Using Donabedian's Structure-Process-Outcome framework, it is proposed that TBL outcomes are dependent on sound structures (TBL design) and processes (TBL delivery). Therefore, when interpreting the results of studies of TBL in nursing education, TBL "dose" is an important consideration.

Methods:

The aim of this scoping review was to explore TBL structure and process elements reported in studies of TBL in nursing education. Original research, published in English, and reporting learner outcomes of TBL in nursing education were included. Cumulative Index to Nursing and Allied Health literature (CINAHL), MEDLINE Complete, PsycInfo, and Education Resources Information Center (ERIC) were searched on 15/02/2021. Titles and abstracts and full-text papers were screened independently by two reviewers

Results:

Of 226 potentially relevant citations, 45 studies were included. The specific TBL elements reported in included studies were team size (n = 41), team formation (n = 24), readiness assurance process (n = 45), immediate

feedback (n = 42), activity sequencing (n = 42), 4S application design (n = 13), incentive structure(s) (n = 22), and peer evaluation (n = 13).

Conclusion:

There was variability in the reporting of TBL design elements. Preclass preparation and individual and team Readiness Assurance Tests were well reported. Application exercise design and approach to peer evaluation were gaps in the included studies. Studies of TBL in nursing education should be more explicit about the TBL structure and process design elements used (or not used). Although deviation from recommended TBL design elements may be warranted, the nature and rationale for deviations should be explicitly reported and the impact on TBL dose made transparent.

3 Short communication

Title: Adapting Team Based Learning to Changing Times

Authors: R. Howard, A, Burgess, K, Charles (University of Sydney)

Rosa.howard@sydney.edu.au

Background:

Year 1 in the Doctor of Medicine degree at the University of Sydney is a flipped teaching program where students engage with online videos, in person teaching, and practicals on a teaching theme of the week. Team Based Learning (TBL) is the capstone student-centered team activity based on the theme of the week. The TBL aims to contextualize, integrate, reinforce and consolidate key basic and clinical science topics covered in the preceding weeks teaching activities and includes the generation of a capstone mechanistic concept map underpinning the patient case.

Description of work:

The TBL format has transformed its format and delivery since it was first introduced to address student feedback and changing pressures in unprecedented times. Early problems encountered were recruitment of large number of skilled teaching staff and student dissatisfaction with perceived teaching inconsistencies across the TBL rooms. In the recent era of physical distancing, the TBL was moved to an online synchronous and asynchronous format including an online review of the case with a small expert panel of clinicians and basic scientists. A subsequent hyflex format followed by the current fully in-person arrangement using a mixture of teamwork and in person cohort review of the case has been employed. Post session completion of a mechanistic diagram has been maintained throughout the various format iterations.

Conclusion:

Even after the various changes demanded by circumstance and feedback, the re-work of the TBL has maintained the pedagogical framework and the critical aspects of teamwork and resulted in a format that has addressed early challenges and improved student satisfaction and teaching consistency.

4 Short communication

Title:

Team-Based Learning Approach for Overcoming Math Anxiety in Biochemistry (University of NSW)

Authors

Nirmani Wijenayake

b.wijenayakeg@unsw.edu.au

Background:

Biochemical calculations are one of the most challenging concepts to master when studying biochemistry. The interdisciplinary nature of biochemistry means students must seamlessly integrate chemistry, biology, and basic mathematics when doing calculation questions. Many students are also math-anxious, leading them to avoid math-based subjects or concepts. This avoidance creates an emotional barrier to learning, resulting in poor academic performance, and exacerbating students' perception of the impossibility of mastering calculations. Therefore, finding effective ways to teach biochemical calculations is important to support student learning.

Methods:

In a second-year biochemistry course, students were organized into groups from the beginning of the term to foster a collaborative learning community where they could collectively engage with biochemistry concepts. This initiative included conducting a biochemical calculations workshop in Week 1 of the term and providing numerous problems for students to collaborate on until the Biochemical Calculations Quiz in Week 4. A team-based learning approach was implemented for the quiz, wherein students initially completed the quiz individually before transitioning to their respective groups to collectively tackle the same quiz. Both components carried associated marks. The rationale behind this approach was to allow students the opportunity to discuss questions, teach one another, and receive immediate feedback on their performance.

Students encountered biochemical calculation questions as a group beyond the quiz, allowing them to further refine and enhance this skill throughout the remainder of the term.

Results:

A thematic analysis of student reflections on the biochemical calculation quiz indicated that many students found the group component helpful in identifying and correcting mistakes. They appreciated its collaborative nature, as the group quiz offered a platform for sharing diverse working methods and learning from peers. Students found value in discussing answers, clarifying doubts, and receiving immediate feedback. The consensus on answers also provided a confidence boost. Challenges included potential conflicts, doubts arising from conflicting answers, and instances of one person dominating group decision-making. Immediate feedback was seen as both a pro and a con, as students who did not perform well were disappointed immediately.

Conclusion:

Students identified the development of proficiency in biochemical calculations as one of the top achievements in the course. Setting up groups at the start of the term helped create a collaborative environment where students could rely on each other for learning. Peer instruction and team-based learning can bolster the social, emotional, and cognitive aspects of student learning.

5 Short communication

Title: Using TBL to improve student engagement and outcomes in a PBL-based medical course

Authors

Bronwen Dalziel, Elizabeth O'Connor, Slade Jensen (Western Sydney University, Sydney, Australia)
b.dalziel@westernsydney.edu.au

Background:

Medical schools often choose between either a problem-based learning (PBL) or a team-based learning (TBL) curriculum approach to teach pre-clinical students, but rarely use both pedagogies in the same course. Although the Western Sydney University medical program is currently a PBL approach, we have used TBL in the course to create a more engaged curriculum as students transition from pre-clinical learning to clinical learning environments. We believe that TBL creates better opportunities for students to see a diversity of cases, such as they would encounter in their clinical years.

Methods:

In PBL, students get the opportunity to apply their newly found knowledge in the context of only one clinical case. By the end of their second year of PBL tutorials, students are often disengaged with the pedagogy and sometimes demonstrate limited ability to apply their learning to different clinical scenarios outside of the scope of their PBL case study. The structure of TBL better allows for students to actively apply their knowledge to a larger range of problems and case studies and discover gaps in their learning. In the semester before students move into clinical attachments, students participate in ten modified TBL classes called "clinical classrooms, in the content areas of endocrinology, infectious diseases, immunology and oncology.

Results:

Students particularly value time with research scientists and clinicians to ask content questions with consistent positive feedback since these classrooms were introduced in 2014. As the content and structure has been iteratively improved, students have gone from confidence in "my ability to solve clinical problems" of around 50% (2015) to over 90% in (2020). Feedback (2023) from students includes statements such as "This was an excellent and informative clinical classroom that was effective revision for the allergy lectures. It was extremely helpful studying allergies case by case, especially common ones like asthma. Having points where we were encouraged to refer to past PBLs helped guide our learning and revision." and "This was a great learning experience !!".

Conclusion:

Moving forward, we plan to introduce more clinical classrooms into the curriculum, particularly at points in the curriculum where students will benefit from extra application exercises, such as neuroscience. We believe that there are benefits from combining the unique strengths of the different pedagogical approaches which warrants further exploration.

6 Short communication

Title: Amplifying Team-Based Learning: Leveraging Generative AI for Enhanced Pedagogical Efficiency and Student Engagement

Authors: Ernie Ghiglione, Marcin Cieslak (LAMS Foundation)

ernieg@lamsfoundation.org

Background:

This presentation explores the advantages and implications of integrating Generative Artificial Intelligence (AI) into the process of crafting Team-Based Learning (TBL) lessons at the university level. TBL, a pedagogical approach emphasising collaborative learning and active student engagement, has gained recognition for its effectiveness in fostering critical thinking and problem-solving skills. However, TBL lesson design can be time-intensive and complex, particularly for educators new to the methodology. Generative AI presents a promising solution to streamline TBL lesson creation and enhance the learning experience.

Description of work:

In this presentation, we aim to outline the key benefits of utilising Generative AI in TBL lesson development, focusing on its potential to improve efficiency, maintain content alignment with learning objectives, and provide scalability across diverse student populations. Additionally, it discusses the role of AI in personalising TBL content, promoting continuous improvement through data-driven insights, and ensuring content consistency and quality. Furthermore, the paper highlights the advantages of AI in facilitating adaptive learning and inclusivity while reducing biases in assessment and content creation.

Conclusion:

By analysing the intersection of AI and TBL, this research contributes to the evolving landscape of educational technology and pedagogy. It emphasises the need for a balanced approach, wherein AI serves as a valuable tool to complement the expertise of university lecturers, thereby optimising TBL lessons for an increasingly diverse and digitally-connected student body.

7 Short communication

Title: Games in TBL: improving engagement with the social determinants of health

Authors

Heather Russell, Lisa Hampshire, Christopher Harrison, Marguerite Tracy, Matthew Tyne, Annette Burgess (The University of Sydney, Sydney, Australia)

heather.russell@sydney.edu.au

Background:

Teaching learners about the social determinants of health (SDoH), the non-medical factors that influence health outcomes, is fundamental to addressing health inequities, however, achieving learner engagement with population health concepts can be challenging. Game-based learning offers a powerful approach to improve learner participation and motivation in a safe learning environment. Games are an effective alternative to traditional didactics with equal retention and better attitudes to learning. The Australian Rural Health Game is a unique experiential learning tool encouraging greater engagement with the SDoH in a team learning environment.

Methods:

Between 2021 and 2023, an innovative first-to-finish game was developed by educators and clinicians at the School of Rural Health Dubbo/Orange, Sydney Medical School and Sydney School of Public Health. The game represents one year in the life of a fictional rural person who is exposed to risk and protective factors. The impact of the risk and protective factors on the individual is modulated by their SDoH, outlined on their patient profile. Players visit a health service four times during the game reflecting the average number of visits to a general practitioner (GP) per person each year. At the end of the game, players determine whether their overall health has improved, remained stable or deteriorated.

Results:

The Australian Rural Health Game has been played with hundreds of students across multiple year levels in the Sydney Medical Program. Game mechanics are used to illustrate specific learnings to learners. For example, players experience a lack of agency, their overall health determined by luck and their SDoH which invites players to consider privilege in a safe learning environment. Risk and protective cards can change a patient's SDOH, emphasising that health inequities are not static. Small prizes are used to motivate learner engagement as non-threatening competition capitalises on heightened learner arousal, allowing for high-level engagement and dynamic group discussion. Tools like Mentimeter are used to collate final scores demonstrating that although luck plays a role, when averaged, SDoH are shown to be predictable and measurable at the population level.

Conclusion:

The Australian Rural Health Game addresses some of the challenges of teaching the SDoH through game-based learning. The game offers the potential to be used with a wide range of health professional students,

in interprofessional contexts and in team-based learning. A digital version of the game may increase access to the game and provide further TBL opportunities

8 Short communication

Title: Blended Simulation Education Program Upskills ED Interdisciplinary Health Providers in Managing Behavioural Escalation in Children with Intellectual Disability

Authors

Karl Pobre, Gail Tomsic, Maricel Mariano, Natalie Ong (Sydney Children Hospital Network)

karl.pobre@health.nsw.gov.au

Background:

Children with intellectual disability (ID) with or without co-morbid neurodevelopment disorders, including autism, represent a vulnerable patient group prone to escalating behavioural disturbance when seeking healthcare in emergency departments (ED). Rising incidents are being observed worldwide across acute healthcare centres. Healthcare providers are often not equipped to identify and manage such behaviours, leading to diminished quality of care and negative experiences for families and health professionals. Moreover, a paucity of relevant training programs for healthcare providers is described in the literature.

Methods:

A novel interdisciplinary simulation-based education (SBE) program was implemented to improve healthcare providers' confidence and ability to identify, mitigate and manage escalating agitation in children with ID in the ED. Low-fidelity SBE was blended with pre-learning from the established learning program "Motivated for Change", which was co-designed with child developmental specialists, paediatricians, and families with children. Face-to-face simulation sessions utilised actors to manifest behavioural escalation to augment simulation authenticity. Simulation participants involved interdisciplinary staff native to the ED, including nurses, doctors, and allied health practitioners. A mixed-methods approach using questionnaires assessed the SBE utility and guided program improvements.

Results:

82 participants (47 nurses, 32 doctors and three allied health workers) participated in the blended SBE between April and July 2023. Seventy-five (91%) responded to the post-program survey. The majority of staff members reported that blended SBE was useful in improving confidence in managing children with ND presenting behavioural escalation in terms of identifying escalation, communication, prevention of further escalation, and de-escalation strategies. Thematic analysis of written feedback highlighted the top learning points of partnering with parents, teamwork and environment modifications. The interdisciplinary group of participants felt confident in applying learnings to real-life scenarios following SBE

Conclusion:

Blended SBE programs, authentically designed, improve ED healthcare providers' abilities to identify and manage escalating behavioural disturbance in children with ID. Blended SBE enables real-time practical and reflective learning that improves confidence and competence in managing challenging behaviours in children with ID without compromising patient safety.

9 Short communication

Title

Rapid Evidence for Practice modules: using Team-based learning to teach evidence-based medicine.

Authors

Deonna Ackermann, Annette Burgess, Sharon Reid, Fiona Blyth (The University of Sydney)

deonna.ackermann@sydney.edu.au

Background

Evidence-based medicine (EBM) is a core component in the curriculum of medical education programs worldwide. With the expansion of student-centred learning strategies including flipped teaching approaches and peer-assisted learning, team-based learning (TBL) has gained popularity in medical education. We adapted the classic TBL framework into Rapid Evidence for Practice (REP) modules which will provide students with EBM knowledge and skills and prepare them to apply evidence within short timeframes, simulating real world clinical contexts.

Methods

Year 2 graduate medical students completed a REP module on randomised controlled trials. REP modules comprise online informational content, an individual readiness quiz; a forum featuring a critical appraisal walk through and active learning tasks, and a team-based REP activity where small groups of students rapidly critically appraise a journal article and apply the results to a clinical scenario. Student feedback following completion of the module was collected by questionnaire, using closed and open-ended items. Data were analysed using descriptive statistics and thematic analysis.

Results

In total, 54/259 (20%) of participants completed a questionnaire regarding the REP session. 91% of students agreed that REP activities helped them to develop a way to use evidence to approach clinical questions and 81% agreed that they were satisfied with this method of teaching EBM.

Conclusions

REP modules are an acceptable and feasible method of delivering EBM teaching to graduate medical students.

10 Short communication

Title:

Team-based learning in nursing education: A scoping review of uptake and outcomes

Authors

Judy Currey, Joshua Allen, Nicky Hewitt, Elizabeth Oldland, Stephanie K. Sprogis, Julie Considine (Deakin University)

judy.currey@deakin.edu.au

Background:

Team-Based Learning (TBL) is a student-centred learning strategy that enhances student engagement and facilitates deep learning in a variety of disciplines including nursing. However, the breadth of TBL uptake in nursing education and relevant outcomes are not well understood.

Methods:

A scoping review of international, peer-reviewed research studies was conducted to explore the use and student outcomes of TBL in nursing education. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews framed the study. The Cumulative Index of Nursing and Allied Health Literature, MEDLINE Complete, PsycINFO and Education Resources Information Center were searched. Original research studies, published in English, and reporting on student outcomes from TBL in nursing education programmes were included.

Results:

Of the 1081 potentially relevant citations, 41 studies from undergraduate (n = 29), postgraduate (n = 4) and hospital (n = 8) settings were included. The most frequently reported student outcomes were knowledge or academic performance (n = 21); student experience, satisfaction or perceptions of TBL (n = 20); student engagement with behaviours or attitudes towards TBL (n = 12); and effect of TBL on teamwork, team performance or collective efficacy (n = 6). Only three studies reported clinical outcomes.

Conclusion:

In the past decade, there has been a growing body of knowledge reported regarding the uptake and outcomes from TBL in nursing education. Methodological gaps identified in this scoping review were the lack of randomised controlled trials and the dearth of studies of TBL in postgraduate and hospital contexts.