

Facilitating transition to medical school for undergraduate students through medical student-led case-based learning workshops within a combined Bachelor of Science and Doctor of Medicine program

Faciliter la transition vers la faculté de médecine pour les étudiants de premier cycle grâce à des ateliers d'apprentissage par cas animés par des étudiants en médecine, dans le cadre d'un programme combiné de baccalauréat en sciences et de doctorat en médecine

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Implication Statement

We developed and implemented an interdisciplinary workshop to increase confidence amongst pre-medical students when transitioning to medical school. We were inspired by the collaborative small-group Case Based Learning (CBL) sessions from the pre-clerkship curriculum at our medical school. By involving medical student volunteers as group facilitators, this workshop was a feasible and sustainable addition to medical school preparation for undergraduate students enrolled in an integrated medical pathway. Furthermore, our model suggests advantages for similar programs at other institutions, providing early exposure to clinical expectations.

Énoncé des implications de la recherche

Nous avons conçu et mis en œuvre un atelier interdisciplinaire visant à renforcer la confiance des étudiants en pré-médecine lors de leur transition vers la faculté de médecine. Nous nous sommes inspirés des séances collaboratives d'apprentissage par cas en petits groupes (CBL) du programme pré-externat de notre faculté. En mobilisant des étudiants en médecine bénévoles comme animateurs de groupe, cet atelier a représenté un ajout faisable et durable à la préparation médicale des étudiants inscrits dans un parcours intégré. De plus, notre modèle présente des avantages potentiels pour des programmes similaires dans d'autres établissements, en offrant une exposition précoce aux attentes cliniques.

Introduction

We incorporated an early introduction to Case Based Learning (CBL) for students in the accelerated Bachelor of Science/Doctor of Medicine (BS/MD) program curriculum through a medical student-led workshop to ease the transition to medical school. While CBL is extensively studied in medical programs, its application in undergraduate medical pathway programs remains relatively unexplored.¹

The transition to medical school can be challenging due to its complex and heavy curricula, often contributing to decreased academic performance.² According to the cognitive load theory, working memory has a limited capacity. Introducing students to an overload of new information and new teaching styles hinders learning.³ Pre-training or prior learning can facilitate the transfer of knowledge to long-term memory, aiding the transition to medical school.⁴

CBL was chosen for its collaborative model involving more knowledgeable peers or faculty to develop relevant knowledge through case exercises. According to Vgotsky's Zone of Proximal Development model, preceptors may enhance learning by introducing information slightly beyond their current knowledge level, promoting growth towards independence.⁵

Innovation

The Augusta University BS/MD Program offers accelerated undergraduate education and conditional early acceptance into the Medical College of Georgia, totaling seven years.

CBL is an inquiry-based approach that had not yet been introduced to BS/MD students at Augusta University. All sophomore and junior BS/MD students were organized into groups of eight, mirroring the medical school structure. Students were mentored by medical student facilitators and participated in an annual CBL activity adapted for the pre-medical level. According to Vygotsky, CBL is most effective when tasks exceed the learner's current abilities but are attainable with guidance. The case incorporated pre-medical curriculum content and included a patient's history of the present illness, past medical history, review of systems, physical exam, diagnostic labs, and imaging. Over two 3-hour sessions, students worked through a single case with a 15-minute introduction to the three objectives and the structure and process of the CBL curriculum. We encourage similar programs to adapt CBL components aligning with their medical school (Table 1).

Evaluation

The study employed grouped retrospective pre- and post-intervention self-assessments. Researchers distributed the survey at the workshop's conclusion, where students evaluated their abilities before (retrospectively) and after the intervention.⁶ Survey results measured the workshop's effectiveness in meeting objectives, and student feedback assessed participation and engagement. Attendance was 100% ($N = 30$) for the inaugural workshop. This study was deemed exempt from the Augusta University Committee B Institutional Review Board under federal regulations, 45 CFR 46 (DHHS) 2018 Requirements.

Table 1. Key components for implementing a CBL workshop

Number of Participants	Groups of 8, with as many groups as needed
Number of volunteers	1-2 per group Current medical students Medical school faculty members (not required)
Curriculum outline	Key learning objectives Introduction to CBL presentation Case components including: HPI, physical exam, ROS, labs and imaging (if applicable) Facilitator guide: discussion prompts, differential diagnoses, patient management strategies
Training of facilitators	1 week in advance - distribute facilitator guide and designated case 1-2 days before - pre-workshop meeting: address questions and discuss role 1 day post-workshop - receive feedback
Roles of facilitators	Engage all students Redirect focus/maintain relevance Pose engaging questions Provide guidance and clarify concepts Optional: Offer continued mentorship
Resources required	Large room Laptops with internet connection Access to Google Docs or other collaborative platform
Assessment methods	Retrospective pre-post surveys (Optional) objective assessments: MCQs, short answer tests Qualitative feedback
Stakeholder engagement/institutional support	Medical School: Office of Academic Affairs OR Curriculum Office Undergraduate: Pre-medical advisement office OR program coordinator

Input data

Using SAS 9.4 and a significance level of 0.05, we calculated frequencies and percentages for all survey questions. Due to non-normally distributed data, Wilcoxon signed-rank paired tests determined differences in student competency pre- and post-workshop. Table 2 shows statistically significant improvements in distinguishing CBL roles, understanding and interpreting CBL case components, and formulating a differential diagnosis ($p < 0.05$, Table 2).

Table 2. Results of paired Wilcoxon-Signed-Rank tests calculated to determine if competency ability differed from retrospective pre-post-test workshop. $N=30$.

To what extent are you now/were you able to meet the following objectives? (1 = "not at all," 5 = "completely")	Mean (SD) Post	Mean (SD) Pre	Mean (SD) Post-Pre	p-value
Objective 1: Distinguish between the following CBL roles: Leader, Scribe, IPASS, Fact Finder	4.3 (0.8)	3.2 (1.6)	1.1 (1.3)	<0.05
Objective 2: Understand and interpret the different components of a case: History of Present Illness, Past medical history, Review of systems, Physical exam	4.3 (0.7)	3.3 (1.3)	1.0 (1.0)	<0.05
Objective 3: Formulate a differential diagnosis	3.9 (1.0)	3.0 (1.6)	0.9 (1.1)	<0.05

Next steps

Based on statistically significant improvements in CBL competencies, we are expanding the program to include biannual workshops for all undergraduate levels in our BS/MD program. Medical students, guided by the Medical Student Affairs Office, will facilitate these workshops through a student organization at the Medical College of Georgia, ensuring long-term sustainability and evolving case content as students progress through their curriculum. Limitations of this study include the small cohort size and the subjective nature of self-reported data.

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