TPACK Among Medical Educators: What is our readiness to teach with technology?

RIME Research Papers
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Purpose: The literature on faculty development of medical educators largely focuses on content, pedagogy and leadership. Technology has become increasingly pervasive in current educational models. Accordingly, the knowledge to effectively teach using technology has become a requisite skill for educators. However, little is known about medical educators’ preparedness to teach with technology. This study aimed to empirically assess medical educator knowledge of pedagogy and technology to better inform the direction of medical school faculty development efforts.

Approach/Methods: The Technological Pedagogical and Content Knowledge framework (TPACK) survey is a validated instrument for understanding educators’ knowledge of content (CK), pedagogy (PK) and technology (TK) in teaching. A modified version of the TPACK was administered to medical educators at two public institutions (N=76).

Results/Outcomes: An independent-samples t-test was conducted to compare TK to PK and CK within each institution. The means of TK (UC Irvine: 3.4; CU 3.4) and both PK for a didactic session (UC Irvine: 3.9; CU: 4.4) and PK for a clinical setting (UC Irvine: 4.0; CU=4.4) were compared using a t-test and found to be statistically different, P < .01. Similarly, the means of TK and CK (UC Irvine: 4.5; CU: 4.7) were found to be statistically different, P < .01.

A Wilcoxon Rank Sum test indicated that the CU PK for a didactic session (Mean=4.4) was greater than the UC Irvine PK for a didactic session (Mean=3.9), P < .01. Similarly, the CU PK for a clinical setting (Mean=4.4) was greater than the UC Irvine PK for a clinical setting (Mean=4.0), P < .01.

Conclusions: There is a clear need for faculty development programs for medical educators to focus on how to teach with technology if medical schools continue to adopt technology within their curricula.
Reconsidering Basic: Integrating Social and Behavioral Sciences to Support Learning

RIME Research Paper

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Introduction: The integration of basic science mechanistic knowledge (pathophysiology and etiology) with clinical features (signs and symptoms) during learning leads to robust cognitive representations in novices and supports the development of clinical reasoning, including better diagnostic accuracy and later learning of related concepts. However, previous studies have utilized a limited scope of traditional biomedical sciences, including biochemistry, anatomy and physiology. The use of extended forms of foundational knowledge, including behavioural and sociological sciences, that have been proposed to support learning and performance in complex health systems remains unexplored.

Methods: 33 first-year medical students from the University of Toronto MD Program participated in the study. We compared the effect of Integrated Extended Basic Science (EBS) learning to Clinically Focused instruction (CF) on an initial assessment (IA) of diagnosis using clinical vignettes and a ‘preparation for future learning’ assessment (PFLA) to assess learning of new related content in medical psychiatry (co-occurring physical and mental health conditions).

Results/Outcomes: We found that both forms of instruction supported the development of diagnostic ability on initial assessment (t(30)= 1.20, P = 0.24). On the PFLA we found that integrated instruction of extended forms of basic science led to superior performance on assessing complex patients’ health care needs t(30)= 2.70, P < 0.05.

Discussion: Similar to previous studies using integration of biomedical sciences, the integration of EBS can enhance later learning of new related concepts. These results have implications for curriculum design to support development of expert clinical reasoning.
A Continuum of Innovation: Curricular Renewal Strategies in Undergraduate Medical Education, 2010-2018

RIME Research Paper
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Purpose: Since 2010, medical schools across the United States have engaged in a new cycle of curricular revision and renewal for their undergraduate medical curricula. But what structures, features, and trends have emerged in American Medical Schools as a result of deliberate curricular redesign efforts? We present an analysis of the ways that medical schools have approached the reorganization of their curricula to prepare their students for the growing complexity of medical practice.

Methods: This study drew a total pool of 40 MD-granting programs in the United states, of which 25 met the inclusion criteria for the study. We used a qualitative coding approach to materials from the UME program websites to identify four dimensions of strategies that these programs used to renew their curricula.

Results/Outcomes: Our analysis of the curricular maps and website content of the UME programs provided evidence for a continuum approach to the description of innovation strategies. 96% of schools employed a cohort-based linear pathway, 80% of schools used thematic basic science blocks, 47% placed their Step 1 exams outside of the second year, and 68% moved their clerkships to the second year.

Conclusion: The Continuum of Innovation strategies will enable programs to renew their curricula in ways that promote deliberate curricular changes that are consistent with the emerging needs in the field. This study and future research may be useful for UME programs with limited resources by having consensus practices that enable them to plan curricular changes in ways that best serve their institutions.