



Integrating Foundational and Applied Science in the Preclinical Curriculum: A Scoping Review

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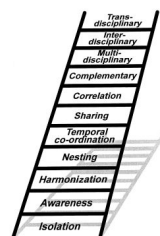
Background

Overall Purpose:

Use a scoping review as a means to **summarize types of integration** and **methods to evaluate them** in preclinical courses in undergraduate medical education in the US and Canada.

What is a Scoping Review?

Uses a systematic method of searching the literature to **examine evidence on a topic**, to **identify knowledge gaps**, and to **refine questions for further research and review**.



Harden's Integration Ladder

Research Question

How do medical schools define and implement **integration** of basic and clinical sciences within **preclinical** courses in undergraduate medical education (UME) and how is the **efficacy** of integration measured?

Methods

Our search strategy was designed to capture the range of integration efforts being used in preclinical medical education at the course level

Inclusion criteria: (1) Integration during preclinical phase of UME, (2) Integration at the course level, (3) Quantitative and/or qualitative studies of preclinical integration interventions

Exclusion criteria: (1) Non-English language, (2) No intervention evaluated, (3) Integration measured at a program-wide level, (4) Integration restricted to clinical phase, (5) Institutions outside US & Canada, (6) Editorials or commentaries, (7) Type of integration not defined

Category	Search Terms
Education	medical school, medical education, undergraduate medical education
Integration	integration, integrated curriculum, basic and clinical science integration
Additional Qualifiers	preclinical course, efficacy

Databases searched: PubMed, ERIC (Education Resources Information Center), Scopus

Results

Integration Category	Examples
Content Integration	Clinical vignettes Case presentations Patient panels Clinical-pathologic correlation Simulation Exercises* Basic & Clinical Faculty Co-Teaching*
Structural & Format Integration	Case-based learning (CBL) Problem-based learning (PBL) Videos of patient interviews Peer or near peer learning Integration course Simulation Exercises* Basic & Clinical Faculty Co-Teaching*
Clinical & Diagnostic Tools	Ultrasound in anatomy lab CT and other imaging of cadavers Surgical techniques in anatomy lab

Figure 1. Categories and examples of preclinical integration identified in the literature. Examples cover both horizontal (across disciplines and topics) and vertical (across basic and clinical sciences) integration. An asterisk (*) indicates that an example is in multiple categories.

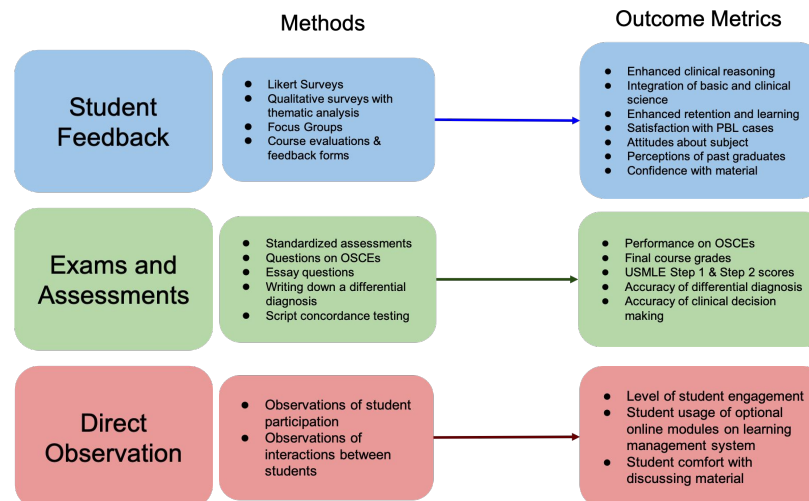


Figure 2. Methods and outcome metric to evaluate preclinical course integration. Categories include subjective student feedback, exams and assessments, and direct observation of students.

Results

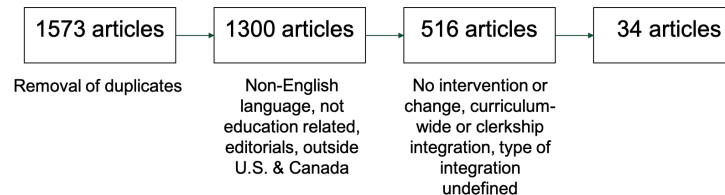


Figure 3. Results of literature search and screening process. A total of 34 articles were included in our analysis of preclinical integration.

Conclusions and Future Directions

- There is no universally accepted framework of effective curricular integration at the course level in US & Canadian medical schools
- There is a lack of standardization in methods to evaluate the success of integration efforts
- We hope to use these data to design & test new methods to evaluate the extent and quality of curricular integration within UME courses
- We hope to work with faculty in applying these methods to enhance student outcomes

Acknowledgements

We would like to thank Dr. Lynn Foster-Johnson, Assistant Professor of Medical Education, and Paige Scudder, Biomedical Research and Education Librarian, for their guidance in conducting the scoping review. We would also like to thank the Geisel School of Medicine and Department of Medical Education for supporting this project.

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