

Evaluating the Impact of Reduced Classroom Time and Increased Independent Learning on Student Performance in Integrated Foundational Sciences

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Introduction

Virginia Tech Carilion School of Medicine (VTCsOM) recently implemented a strategic redesign in the Phase 1 curriculum to reduce classroom time, increase independent learning opportunities and modify engagement in problem-based learning (PBL).

- In this new construct, learners receive weekly learning objectives and curated resources to guide their independent learning.
- Additional tailored case-specific objectives are provided for each weekly PBL case.

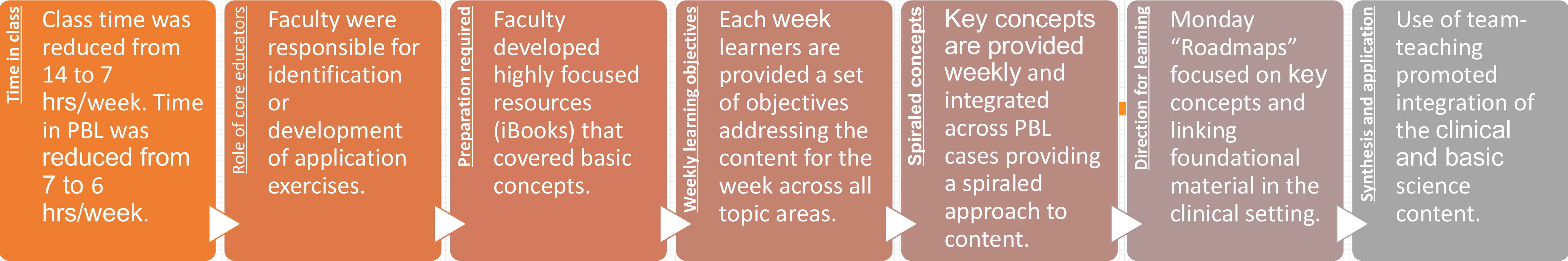
With reduced classroom contact hours, learners are expected to acquire most foundational content through independent study or in the PBL setting.

We sought to evaluate changes in learner performance across content delivered in the classroom by a content expert (formal learning) compared to content addressed independently through problem-based learning or other non-directed learning opportunities (independent learning).

Weekly Structure -- **Unscheduled time is open time for preparation**

Week 2 VTCsOM 55 - Fever					
Date/Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 AM					Unscheduled time
9:00 AM	PBL Cases Facilitators - Team Rooms	Community & Clinical Immersions 8:00-11:00	PBL Cases Facilitators - Team Rooms Review LOs & continue case	Synthesis and Application: Basics of Inflammation Innate Immunity Antibiotic targets	PBL Cases Facilitators - Team Rooms Review LOs & case epilogue
10:00 AM	Roadmap: Key concepts: Hallmarks of inflammation; microbiology intro, Definition of fever, interview skills: personal /emotional story	Nurse Shadowing CRMH Student Group 2	Research & Inquiry 10:00 -11:30	HSSIP - 10:00-11:30 Public Health, Population Health, and Community Health; Interprofessional Practice Michelle Rockwell/ Natalie Karp M106	Donor Ceremony 11-12 M203
11:00 AM					
12:00 – 1:00 PM	Lunch	Lunch	Lunch	Lunch	Lunch
1:00 PM		Tissues & Organs M210	Community & Clinical Immersions 1:30 - 4:00		
1:30 PM					
2:00 PM		Clinical/Anatomy Waves:	Roanoke City Health Department Cynthia Morrow Student Group 1 1502 Williamson Road, Roanoke, VA 24012	Unscheduled time/ CCI	Unscheduled time
2:30 PM		1. Patient-Centered Interview Skills Part 2 — Team rooms			
3:00 PM					
3:30 PM	Unscheduled time	2. Intro to Osteology - M210 - focus on structures for upcoming CS w/s & PBL case			
4:00 PM					
4:30 PM					

Key changes implemented in Phase 1 Design



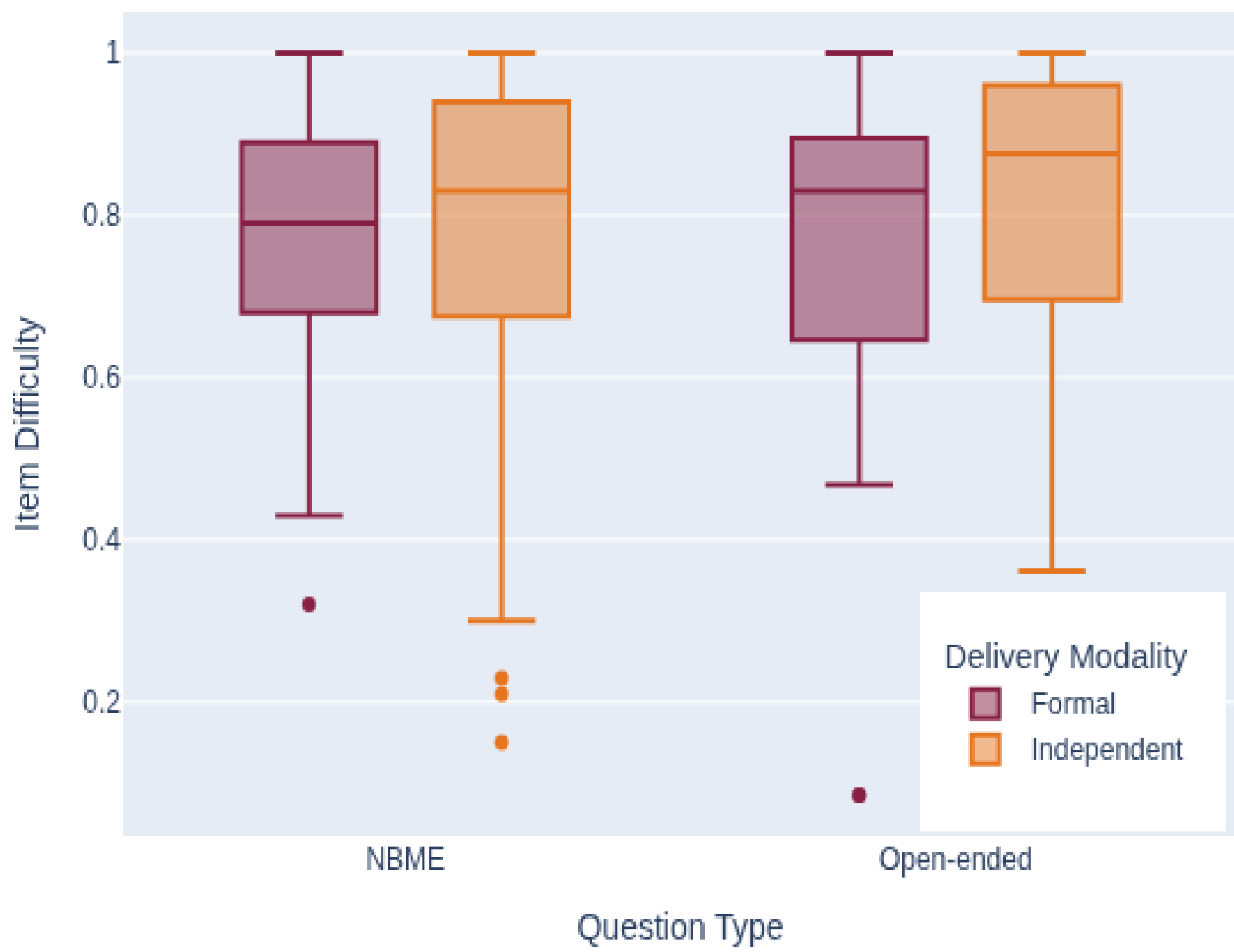
Methods

To assess the impact of these changes,

- Mapped open-ended and standardized NBME customizable assessment services (CAS) to course learning objectives in Integrated Foundation Sciences 1 (IFS1)
- Determined if the objective was covered as part of formal learning or non-directed learning
- Compared performance in the two groups: Formal learning vs. independent learning

Compared performance on NBME end of course questions from AY 23-24 vs. 24-25 to address overall performance impact in IFS 1.

Comparison of Student Performance Across Delivery Modalities



Levels of Learner Autonomy

No Autonomy

- Faculty Directed - Lecture

Teacher-learner Guided

- In-class activities

Collaborative learning

- Problem-based learning

Guided Self-learning

- Weekly preparation

Independent Learning

- Addressing specific knowledge gaps

Formal

Independent

No change in performance

Results

Across all data sets evaluated, there was no statistical difference in student performance between the independent learning or formal learning assessment questions (independent learning n=21 open ended questions; 81 MCQs; formal learning n=33 open ended questions; 69 MCQs).

There was also no statistical difference in student performance on the 122 NBME summative multiple-choice questions when compared to the prior academic year 23-24.

Conclusions

These data collectively suggest our learners can maintain a high degree of success on basic science assessments within the restructured curricular format.

- No change in performance on NBME customizable assessment services (CAS) questions addressed in class vs. independently.
- No change in end of semester performance on NBME questions when compared to previous academic years.

It is possible that the updated curricular presentation model and focus on tailored learning materials amplify learners' efficiency and engagement in Phase 1.

Future Work

- Review performance across semesters and academic years.
- Identify areas of opportunity to diversify assessment question type.
- Review distribution of subject specific content across learning modalities.