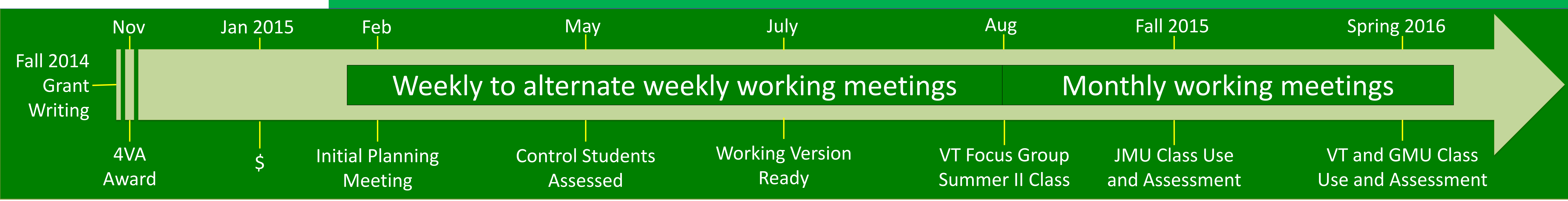


# Development of an Interactive Human Body Digital Reusable Learning Object (RLO) to Provide Whole Body Systems-Based Learning in Vitamins and Minerals

Sina Gallo<sup>2</sup>, Deborah J. Good<sup>1</sup>, Jeremy Akers<sup>3</sup>, Anita Walz<sup>1</sup>, Lujean Baab<sup>1</sup>  
<sup>1</sup>Virginia Tech, <sup>2</sup>George Mason University (GMU), <sup>3</sup>James Madison University (JMU)



### Objectives for the Session

- Define what is meant by a reusable learning object (RLO) and the application to student teaching and learning at the university level.
- Understand how an RLO is developed for the use of undergraduate and graduate teaching of vitamins and minerals.
- Recognize the different types of student learners as well as the student interest and utility of digital objects in online learning.

### Rationale

- University teaching and textbook instruction of micronutrients (vitamins and minerals) has been limited to a nutrient by nutrient approach, yet, micronutrients have complex interactions with multiple body systems.
- Accompanying visuals, text and interactive learning may provide higher material understanding and retention in nutrition/micronutrient classes.
- To fill this gap, a freely accessible and reusable digital learning object (RLO) was developed to explore a systems-based teaching approach to the teaching of micronutrients.

### Methods

- Computer usage, learning styles and content knowledge were assessed in undergraduate/graduate students enrolled in a micronutrients course at Virginia Tech, JMU and GMU unexposed (control) to the RLO in 2015 and exposed in 2016. Results presented are for the control group only.
- Students' learning styles determined based on Kolb's Learning Style Inventory (Manolis et al., *Learn Individ Differ* 2013).
- Standard Likert scale assessed interest in using digital simulations and perceived use of the RLO.
- Graded questions on the skeletal system used to demonstrate understanding of a key nutritional concepts.

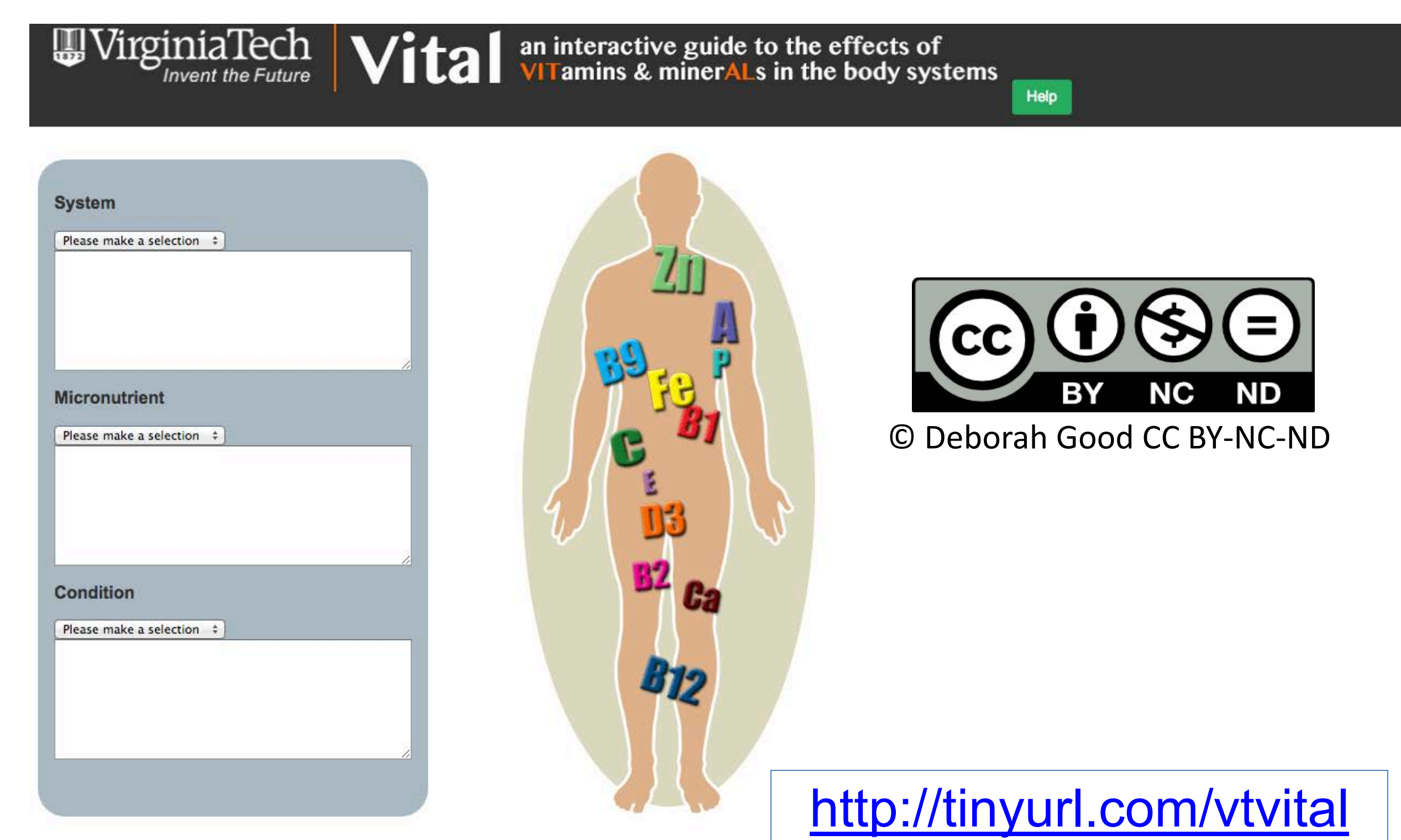


Table 1: Demographics

Categories	Virginia Tech	JMU	GMU
Total Number	152	5	26
Age	21.36 ± 0.91	N.D.	32.38 ± 11.86
Gender	female = 112 (73.7%) male = 40 (26.3%)	female = 4 (80%) male = 1 (20%)	female = 23 (88.5%) Male = 3 (11.5%)
Academic Level	Juniors = 56 Seniors = 94 Graduate students = 2	Graduate students = 5	Junior = 1 Graduate students = 25

Figure 1: Student Learning Style

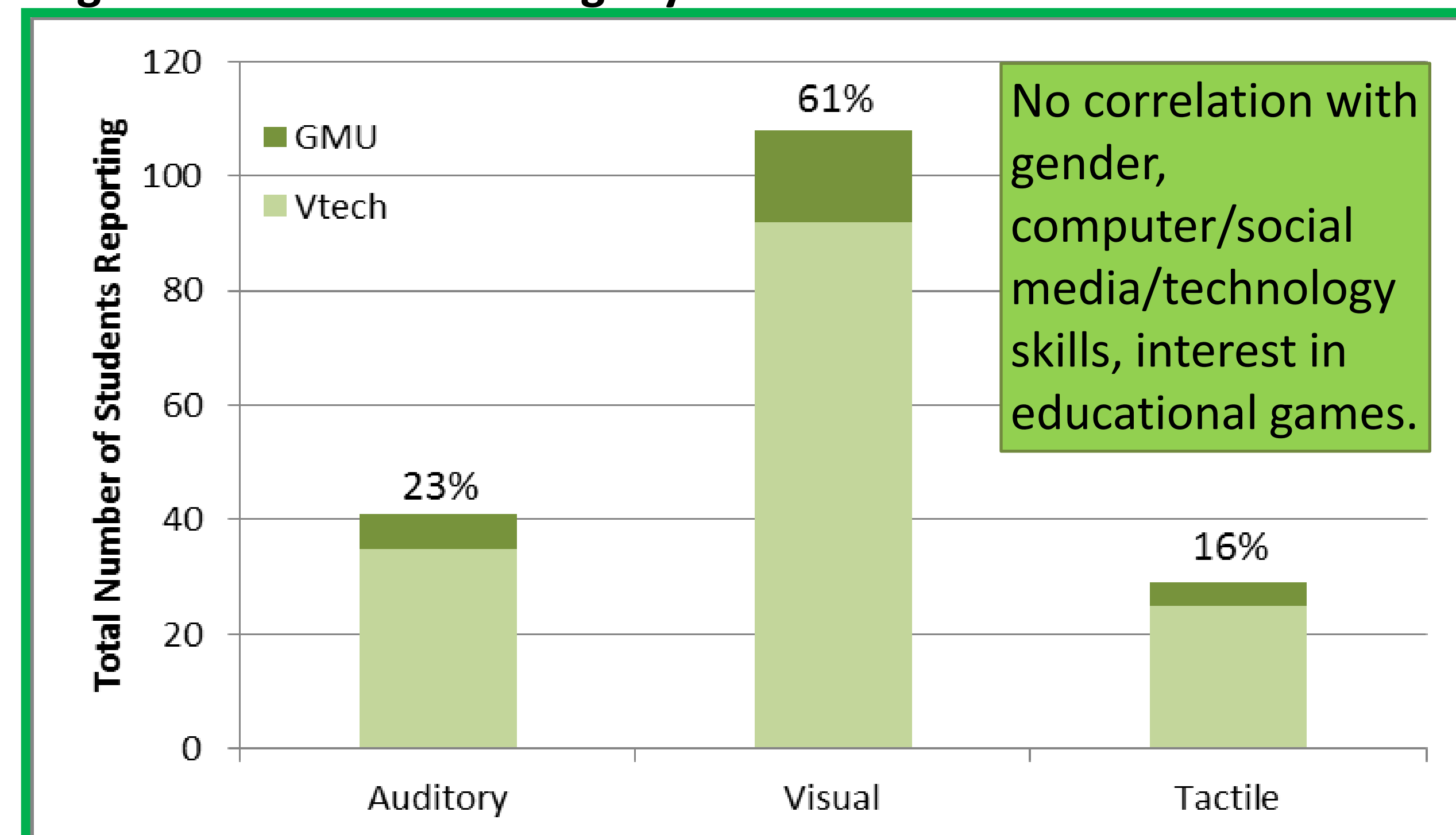
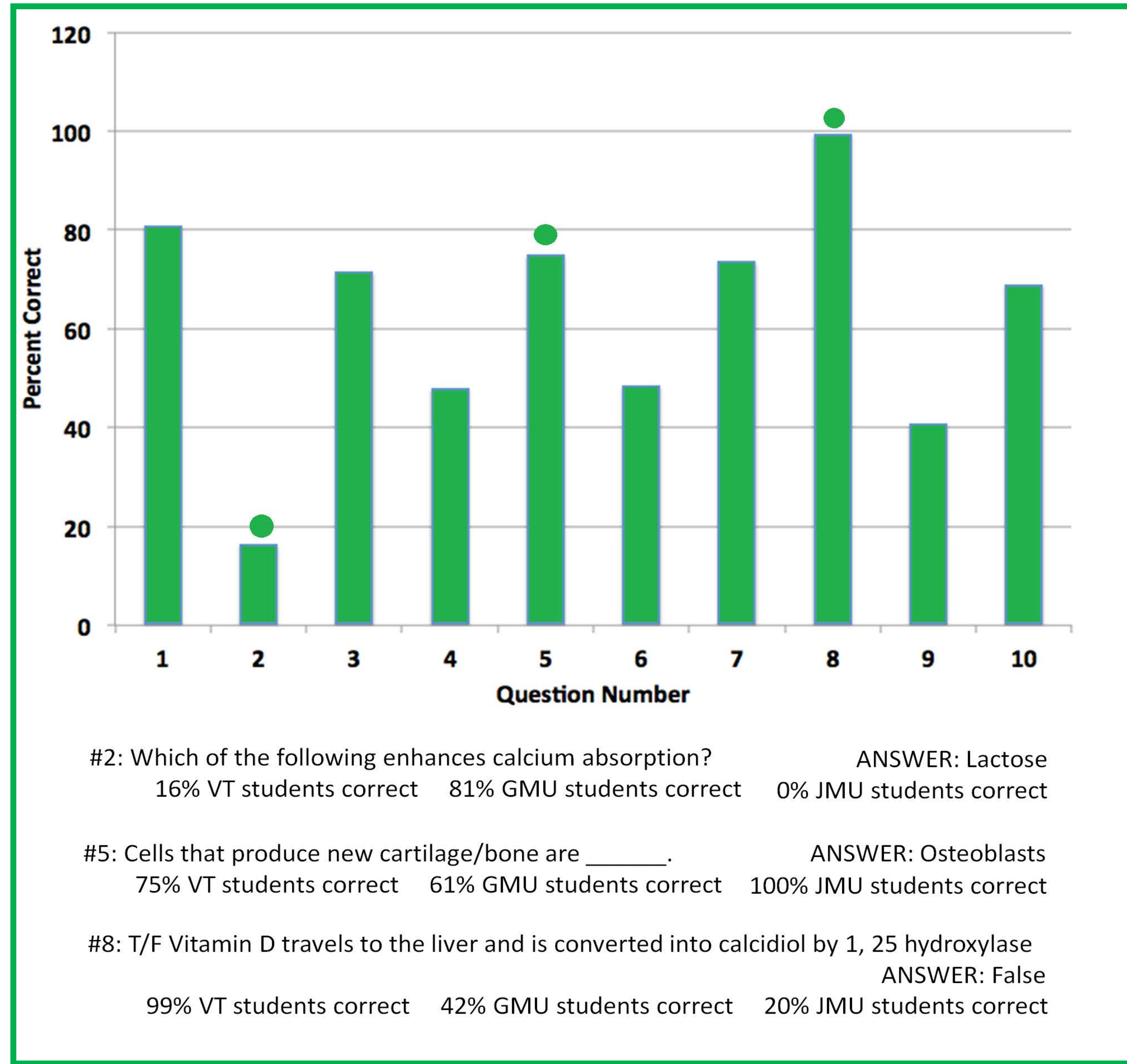


Figure 2. Skeletal System Knowledge



### Lessons Learned and Future Directions

- Students want a fun site to explain course material.
- Building the RLO requires money, time and a team approach which integrates content experts, instructional, graphic and web designers, database and programmers, legal/copyright experts.
- Future updates are planned to expand the RLO to other body systems.

**Project Funded by:**   
**Acknowledgements**  
 Deyu Wu: Statistics  
 Cindy Keister: Design  
 Oddjoern Hestnes: Programming