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More than roll, move, MCG (multiple choice question): adoption of tabletop game mechanics in anatomy education

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Keywords

Anatomy, serious game, gamification

Abstract

Introduction: Anatomy is an important topic in health professions education with the unique challenge of teaching the relation of structures in three dimensional space. Educators have adopted the use of games for this topic. Intrinsic integration is a theory that suggests better outcomes for educational games when the educational content is incorporated into the core mechanics of the games¹. This integration has been shown to lead to better learning outcomes compared to control versions of educational games^{1,2}. Proponents suggest that games should provide an external representation of the content which is explored through gameplay³. This is done through game mechanics which are the “actions, behaviors and control mechanisms afforded to the player⁴”. We hypothesize that designers of games for anatomy education will have adopted tabletop game mechanics that facilitate this integration. We explore this by reviewing the mechanics of anatomy games and how these mechanics interact with the learning goals.

Methods: We assembled a pool of games designed to teach anatomy to health professionals through two processes, the first being a literature search and the second being a search of online sources of games for medical education. Games that met inclusion criteria (tabletop games for health professionals education on the topic of anatomy) were reviewed by two investigators for their mechanics. The mechanics were coded based on a published framework⁵ and the mechanic(s) most aligned with the learning goals were identified and described.

Results: A total of 32 games met inclusion criteria including games for MD/DO, nursing, dental, veterinary and physical therapy education. The most common mechanisms linked to learning goals were questions and answers (9), communication limits (8), and set collection (7). Question and answers based games generally did not have well integrated mechanics and the content could be easily substituted (think of trivial pursuit with the questions

switched for anatomy questions). Communication limits games often used Taboo-like mechanics to teach content or terminology. One game ClueConnect stood out with communication limited to the use of tiles with relevant terms like “superior”, “distal”, “epithelial”, “secretory”, and “articulates”. Set collection was integrated with players collecting sets of structures with anatomic proximity, aligning consecutive structures (e.g. proximal to distal) or collecting sets of neurologic signs that linked to a location of a nervous system lesion. Games used a variety of movement mechanics to explore the three dimensional anatomy for example Neuronavigator where players accomplish challenges by navigating through a grid made up of coronal sections of the brain, and Trace the Spread where learners play as bacteria spreading through available pathways in oral anatomy.

Discussion: Anatomy educators have adopted a broad variety of mechanics ranging from simply quiz based games to designs specific to the learning goals. Designers should consider game complexity and accessibility as they use a broader range of mechanics. Accessibility challenges can include variations in color vision as well as physical barriers. Variable experience with game mechanics among learners makes thoughtful adoption of mechanics important as unfamiliar mechanics may provide excessive cognitive load extrinsic to the learning goals.

Learning Objectives

By the end of the session

- Attendees will be able to evaluate a game for its integration of educational content within the structure of the game.
- Attendees will identify tabletop game mechanics suited to their own teaching goals.
- Attendees will recognize potential barriers to inclusivity in the use of tabletop games for education.

References

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