The Flipped Classroom and Self-Directed Learning: Podcasts as a Replacement for Traditional Lecture

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• Replaced traditional, hour-long lectures with sets of podcasts

• Each 1 hour lecture slot results in 3-4 podcasts of ~15min

• Every 2-3 lectures, a previously scheduled lecture hour is used to hold a Q&A session with the professors

• Only a potion of the lectures are podcasted this year
  • TBD if we do the rest
Why Podcasts?

- **Student interest:**
  - Time flexibility for studying
  - Higher resolution allows for smaller figures/text: more information per slide
    - Maintains narrative

- **Professorial curiosity:**
  - Initial time investment (making podcasts), later time returns (no lecturing needed)
    - Maximize teaching resources, methods and technologies with which the students are familiar and comfortable
    - Allows meetings to focus on a discussion of the material as opposed to delivering material
Our “Experiment” and Results

- **Experiment**
  - 1st year medical students
  - Histology course
    - Highly visually oriented
    - Ability to stop and view slides at a premium
  - No lab section (this is not a change from the original course)

- **Results**
  - Positive feedback
  - Test scores seem to be on target
    - Conflated with traditional lectures
• The anatomy of a successful podcast:
  • Maintain cohesion throughout lectures
    • Intra- and inter-lecture
  • Must keep student’s interest
    • Shorter
    • More dynamic
    • Multiple avenues of engagement
  • Draw attention to specific places using motion and color change
  • Keep slides simple (or at least navigable)
• **Issues**
  • Printing presentation
  • Oration not engaging enough/too fast
    • Provide transcript/outline
  • Students that insist they learn more effectively via traditional lectures

• **The Slippery Slope**
  • Will podcasts eventually take the place of the lecture hall, obviating the need for instructors?
  • Not with Q&A sessions, where their expertise is still necessary
**Tools and Techniques**

- **Powerpoint**
  - Animation/selection panes
  - Edit points
  - Recording

- **Handbrake**
  - Changing formats
  - Compressing files

- **Camtasia**
  - Sound mixing
  - Recording screencaptures
**Tools and Techniques**

- **Headset**
  - Mic gives better sound quality
  - Replay is high fidelity, so you can tell if there is a problem with tone or background noise

- **Webcam**
  - Recording yourself for demonstrations or picture-in-picture

- **Graphics tablet**
  - Better control for on-screen drawing (once the learning curve is surmounted)
Maximizing PowerPoint

- Dynamic text/figures/animations
  - Allows pictorial descriptions of difficult concepts
  - Example
- Epidermis (epithelium)
- stratified squamous epithelium
- keratinized, non-vascularized
- Epidermis (epithelium)
- Dermis (mostly connective tissue)

- Two sublayers: Papillary and reticular
- Mostly connective tissue //capillaries.
- Presence of specialized sensory receptors
- Skin appendages such as hair follicles, sebaceous glands and sweat glands in deeper dermis
• Epidermis (epithelium)
• Dermis (mostly connective tissue)
• Hypodermis (superficial fascia of gross anatomy):
  • Technically not a part of skin, but hair follicles, sweat glands and sensory receptors associated with skin are found there
  • Loose connective tissue with varying amounts of fat
Animation can provide a seamless context for information without the use of multiple slides and disjointed oratory.
Higher resolution allows real-time comparison between multiple sources during narration.
1. Single layer of column-shaped cells
2. Often have microvilli or cilia at apical surface.

• Utilizing the ability to stop at any time as a teaching tool
  Self-test slides
Q&A Sessions

- Mandatory

- A 5-6 slide “self-assessment” is given
  - Not graded
  - Board-type and practical questions
  - Instant feedback

- Previous material is opened up for discussion

- Extra time is used for review, quizzing or skills practice

Identify this chamber:

A. Organ of Corti
B. Scala tympani
C. Scala vestibuli
D. Cochlear duct
E. Chamber of Secrets
Conclusions

In short, it appears that podcasts can be used as effective teaching platforms for many situations.

Some important ideas and caveats:

• The main attraction to students is the ability to manage time
  • Must be short
  • Must be navigable
  • Must be cohesive

• PowerPoint is an extremely powerful and flexible tool, but can be enhanced by other programs

• The integral part to this format is the didactic Q&A session that allows students to interact with the professors

• Further study is necessary to discern the effectiveness of this style of teaching. Test performance will decide the fate of this technique
For any questions, please contact me:
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Ciliary Processes

- Ciliary processes
- Pars ciliaris of the retina
- Non-pigmented ciliary epithelium
- Pigmented ciliary epithelium

Walk through scales when necessary
• Extension from ciliary body, divides anterior and posterior chambers

• Outlines pupil

• Consists of:
  • Loose, vascular connective tissue rich in melanocytes and fibroblasts
  • Contains radially oriented myoepithelial cells: dilates pupil
  • Antagonistic muscles are circumferentially oriented (sphincter) smooth muscle; constricts pupil

• Posterior surface is covered by pigmented epithelium

Couple anatomical illustrations with histo – always orient to scale
1. Single layer of column-shaped cells
2. Often have microvilli or cilia at apical surface.
When the ciliary muscle relaxes, tension on the zonule fibers stretches and flattens the lens, allowing the eye to focus at distance.

When the ciliary muscle contracts, tension on the zonule fibers is relieved, allowing the lens to become more round and permitting focus on near objects.

Use animations to demonstrate difficult descriptions.