



Flipping The Classroom

or

How I went from 14 hours of lecture to 3 and still get paid.

Douglas Danforth, Ph.D.
Academic Program Director
LeadServeInspire



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Curriculum Revision at The Ohio State University College of Medicine

Old Curriculum 2 + 2 Approach



Medical Knowledge
and Skills

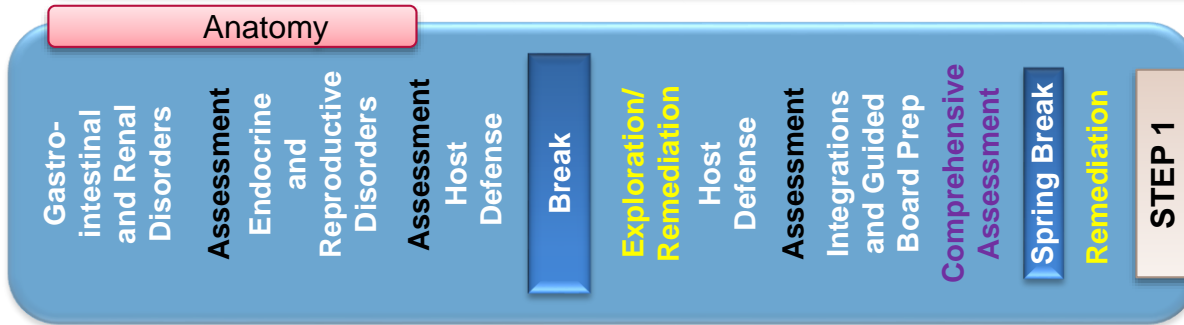


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● ● ● ● Curriculum for Tomorrow's Medicine



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Part One – Med 1-2 – Foundational Sciences



Longitudinal Group

Longitudinal Practice

Longitudinal Projects

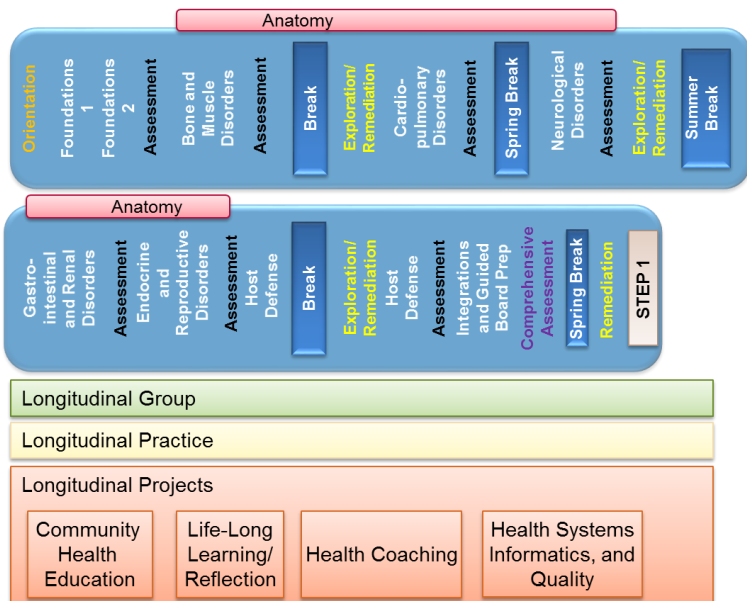
Community Health Education

Life-Long Learning/Reflection

Health Coaching

Health Systems Informatics, and Quality





Part One – Key Design Features

- Reduce emphasis on the standard lecture
- Utilize turning-point sessions, case based clinical correlates, and TBL
- Integration of Foundational and Clinical Sciences

Interactive



Integration of Foundational and Clinical Sciences

- Flipped Classroom Approach



Flipped Classroom

Shift in emphasis



Learn first in class and go home to review notes



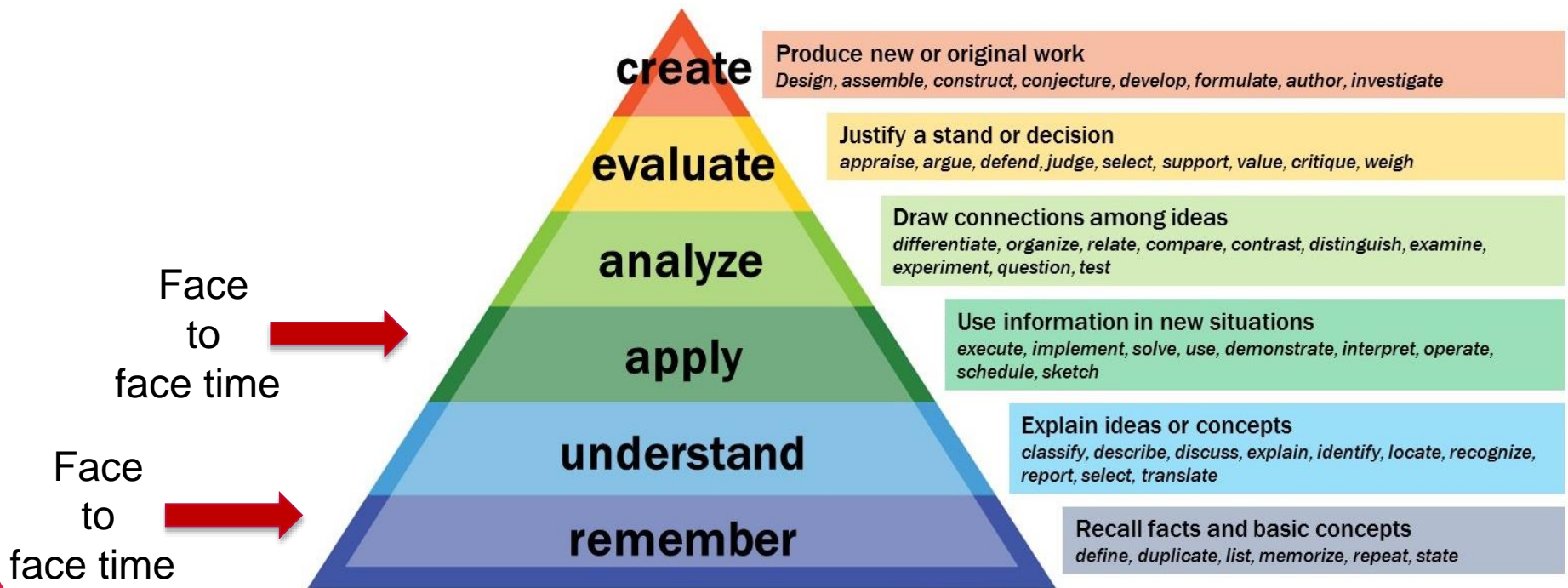
Study at home and come to class prepared for a higher level discussion



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Flipped Classroom

Bloom's Taxonomy



Reproduction Content – previous curriculum.

- Three weeks long
- ~35 hours of lecture
 - Danforth ~ 14 hours
- Separate course for clinical reasoning and patient interviewing/PE
- Anatomy covered at beginning of year (~4 h lecture plus dissections).
- Students in clinic ~1/2 day/month
- No asynchronous content (eLMs)



Reproduction Content – current curriculum.

- Three weeks long
- ~20 hours of lecture (including 4h anatomy)
 - Danforth ~ 3 hours
- 2 TBL
- Integrated content for clinical reasoning and patient interviewing/PE
- Students in clinic every other week
- 25 eLearning Modules (~30 minutes each)
- 5 Case-based discussion sessions



Danforth Reproduction Content – previous curriculum.

- **Male reproduction lecture – 4 hours**
 - Anatomy, histology, spermatogenesis, accessory sex organs, endocrinology
- **Female reproduction lecture – 4.5 hours**
 - Anatomy, histology, oogenesis, accessory sex organs, endocrinology, menstrual cycle.
- **Physiology of pregnancy lecture – 2 hours**
 - Anatomy, histology, endocrinology, embryology, early fetal development, breast and lactation.
- **Sexual differentiation – 1 hour**
 - Including disorders of sexual differentiation
- **Reproductive pharmacology – 2.5 hours**



Danforth Reproduction Content – current curriculum.

- Three “lectures”
 - Male reproductive physiology – 1 + 0.5 hours
 - Endocrinology and spermatogenesis
 - Female reproductive physiology – 1 + 0.5 hours
 - Endocrinology and spermatogenesis
 - Introduction to pregnancy – 1 hour
- Eight eLearning Modules
 - [Male anatomy and histology](#)
 - [Female anatomy and histology](#)
 - [Regulation of the menstrual cycle](#)
 - [Reproductive pharmacology](#)
 - [Normal sexual differentiation](#)
 - [Disorders of sexual differentiation](#)
 - [Breast physiology](#)
 - [Endocrinology of Pregnancy](#)
- Team Based Learning (TBL) exercise on Menstrual Disorders



Flipping the Classroom: *Approaches for Pre-class work*

The screenshot shows a video player interface for a course at The Ohio State University College of Medicine. The video title is "Regulation of the Menstrual Cycle" with a duration of 00:10 / 12:47. The interface includes a sidebar with a menu and a search bar, a main video area with a title and a speaker box, and a bottom control bar with a search field, volume, play/pause, progress, and navigation buttons.

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[More info](#)

Regulation of the Menstrual Cycle

Douglas Danforth, Ph.D.
The Ohio State University

Search... 🔍

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TBL – Menstrual Disorders

- **Resources:**
- Lectures:
 - Female Reproductive Physiology – Danforth
 - Uterine and Ovarian Pathology – Ramirez
- eLearning modules:
 - Female Reproductive Histology – Danforth
 - Regulation of the Menstrual Cycle – Danforth
 - Reproductive Hormonal Pharmacology -- Danforth
 - Infertility – Kennard
 - Contraception – Keder
 - Polycystic ovarian syndrome – Schaffir
- Additional optional reading: Hefner and Schust chapters 15, 30, 31,



TBL – Menstrual Disorders

- **iRAT/gRAT:**
- A 22 year-old college student complains of having no periods for the past year. She attends OSU on a track scholarship and holds the school record in the half-marathon. On examination she is thin and muscular, with a BMI (body mass index) of 18. If her gonadotropins were measured, they would most likely reveal:
 - **A) low FSH/ low LH**
 - B) high FSH/ high LH
 - C) normal FSH/ high LH
 - D) low FSH/ high LH
- A 30 year-old woman undergoes an endometrial biopsy, which reveals tortuous glandular lumens whose borders appear irregular and frayed. The stromal cells are enlarged and eosinophilic. Serum drawn at the same time would show:
 - A) Increased LH
 - B) Increased FSH
 - **C) Increased progesterone**
 - D) Increased inhibin B



TBL – Menstrual Disorders

Application Exercises:

CASE 1

A 24 year-old woman presents complaining of infrequent heavy menses. She says that her periods come 3 to 4 times per year and are heavy with clots. Her last period was two months ago. She also complains of increasing acne and the appearance of hair on her upper lip and chin. She is sexually active but has never gotten pregnant. On examination, she is obese with a body mass index of 35 and moderate facial acne and hirsutism. Her exam is otherwise normal.

CASE 2

A 32 year-old woman has not had a period for over one year. She has no complaints other than some vaginal dryness and occasionally waking up feeling flushed at night. Her examination is normal. When given a progesterone challenge, she does not have any withdrawal bleeding. Her gonadotropins are measured and both the LH and the FSH are very elevated at 50 and 62 IU/l, respectively.



Asynchronous delivery - Pre-class work

- Histology
- Pathology
- Pharmacology
- Physiology
- Anatomy?

In Class delivery

- Clinical syndromes
- Review/Reinforce
Key concepts
- Integrative
physiology



Flipping the Classroom:

Approaches for Pre-class work

eLearning Modules

Advantages

- Interactive
- Self-contained quizzes
- “Professional Quality”

Disadvantages

- More complicated to create
- Difficult to update
- Difficult to manage



Flipping the Classroom:

Approaches for Pre-class work

Independent Learning (reading)

Advantages

- Easy - textbook
- Active Learning?

Disadvantages

- Takes longer
- Generally not a student preference



Flipping the Classroom:

Approaches for Pre-class work

Pre-recorded lectures

Advantages

- Relatively easy
- Relatively inexpensive
- Student familiarity
- Fast-forward

Disadvantages

- Passive
- Limited/no ability for assessment



Flipping the Classroom:

Approaches for In-class work

“Interactive” Lectures

Advantages

- Relatively easy
- Relatively inexpensive
- Student familiarity

Disadvantages

- Relatively passive approach
- Limited discussion
- Are students prepared?



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Flipping the Classroom:

Approaches for In-class work

Case-based discussions

Advantages

- Application of knowledge
- Clinical reasoning

Disadvantages

- Difficult with large groups
- Are students prepared?



Flipping the Classroom:

Approaches for In-class work

Team Based Learning

Advantages

- Proven effective
- Incentivizes preparation
- Works for large classes

Disadvantages

- Needs faculty development to be effective
- Takes longer than other approaches
- Requires more support



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Lessons Learned - flipping the classroom involves special considerations



Flipping the Classroom at Ohio State

Outcomes:

- Content based lectures reduced by 50%-75%
- ~500 eLearning Modules created
- Used in both Med 1-2 and Med 3



“The lecture method is a process whereby the lecture notes of the instructor get transferred to the notebooks of the student without passing through the brains of either.”



Confessions of a converted lecturer
Eric Mazur

