Backward Course Design and Student Career Goals

Development of a Pre-Medical Embryology Course

Keely Cassidy, M.S.
Anatomy (Education-track) doctoral candidate
IUB CITL graduate assistant
kmcassid@indiana.edu
Backward course design identifies desired results and determines acceptable evidence, then builds classroom learning experiences and instruction upon that framework.

In this session, participants will learn the basics of backward course design and see how a pre-medical embryology course used this method to also tailor the final assessment in relation to student career goals in the healthcare professions.
Outline

• Context/Background
• General goals for M300
• Course Development Institute
  – Step 1
  – Step 2
  – Step 3
  – Step 4
• References
Context/Background

• Years of anecdotal evidence from medical students re:
  – Lack of experience with embryology
  – Do not see relevance of embryology
  – Difficult subject matter

• American Association of Anatomists found # of course hours and departmental resources devoted to embryology at all-time low (Drake et al., 2002; 2009; 2014)

• **MSCI M300: Human Embryology**
  – Goal: To provide a solid foundation in embryology to those advancing to professional and terminal degrees
General goals for M300:

1. To provide a solid foundation in embryology to those advancing to professional and terminal degrees
   - Prerequisite: Basic human anatomy course (A215)
2. To demonstrate relevance of embryology to students’ future careers
   - Course applies to Medical Sciences minor degree
     - Fall 2013  n = 21; nursing, pre-med, PT, CNM
     - Fall 2014  n = 17; pre-med, nursing, PA, OT, PT, medical technology
3. To develop communication and writing skills
But how do I design a course?
Course Development Institute

- Co-facilitated by the IUB Center for Innovative Teaching and Learning and Instructional Consulting at the Kelley School of Business
- Open to instructors of any rank, from any discipline or department
- **Goal:** To provide a multiday, interactive forum with instructional consultants and colleagues to develop or redesign a course
- **Method:** Based on backward course design

Applications for 2015 due Friday, April 24th
Backward course design: Step 1

**Course Goals**

*How will my students be different?*

- “By the end of the course, my students will be able to...”
- Measurable and meaningful

[http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php](http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php)
Course Goals

How will my students be different?

EXAMPLES

• Define and Identify the embryology vocabulary necessary to communicate effectively in this field.
• Explain the 3D development of a human embryo/fetus and the relationships of structures to one another during development.
• Analyze the effects of incorrect development (birth defects) to anatomy.

http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php
Backward course design: Step 2

Course Goals

Final Assessment

How will I know they have changed?

How will my students be different?

• “What evidence will they provide to show me that they have changed and achieved the course goals?”
• Does not have to be during ‘finals’
• Should include some higher-order thinking

http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php
M300: Step 2

Course Goals

Final Assessment

How will I know they have changed?

Think about student career goals!!!

Research paper
• Choose a birth defect
• Audience: hypothetical family whose infant has (or will develop) this birth defect

http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php
M300: Human Birth Defect research project/plan Information

Due dates: Topic (via Wiki on Oncourse) Wednesday, October 1
            One topic per student, no repeats in the class.
            Instructor will either approve or you will be notified via email to choose
            another topic by Friday, October 3.

OPTIONAL: Outline or Rough draft Friday, October 24
            Submit an outline or rough draft of your project onto Oncourse. Instructor
            will look at the organization and overall plan of the document and give
            light feedback.

Final project/plan (via Turnitin.com) Friday, November 21
            After submission to Turnitin.com, email instructor with confirmation.

Format: 12 pt. Times New Roman font, 1" margins on all sides, must use citations (style is
         up to you), style is hypothetical dialogue of a conversation between the expert
         (some type of healthcare professional) and the expectant parents of the
         individual(s) with the chosen birth defect

Length: 8-10 pages double-spaced

Points: 200 (or 33.33% of your entire course grade)

Goals:
- For each student to become a budding expert on their topic of choice
- Choose a human birth defect or disorder about which you are interested in learning more
- Research and design a plan for expectant parents on a birth defect, including how to
  avoid and how to treat the birth defect
- Address your topic with scientific clarity and clinical compassion

Audience: Expectant parents of an individual with your chosen birth defect

Final project/plan must include:
- Explanation of the embryological basis of the birth defect including etiology, anatomical
  structures and processes, and relationships to other structures
- Description of the signs and symptoms of individuals with the defect, both as newborns
  and as children and adults (if applicable)
- Plan for expectant parents on how to avoid this defect (if not possible, explain why)
- Plan for expectant parents on how to treat this defect (if not possible, explain why)
- 2 or more original color images (hand drawn and scanned or computer generated)
  showing the embryological processes that lead to the defect
- Use 6 or more peer-reviewed journal article sources (can also use textbooks, website, etc.
  but they will not count toward the 6 required peer-reviewed journal article sources)
- Correct grammar and organizational flow will be evaluated
- Tone of scientific clarity and clinical compassion/empathy to the audience

M300: Human Birth Defect research project/plan Information

Strategies/Resources for getting started and writing:
- Choose a topic you are very interested in, as you will be spending a good amount of time
  on this project.
- Websites that list many different human birth defects:
  - http://www.birthdefects.org/
  - http://www.marchofdimes.com/baby/birth-
    defects.aspx?zclid=C1O7qKE17kCFcU7MgodAUYA5g

- Make appointments or walk-in to IU’s Writing Tutorial Services – they will assist you at
  any stage of your writing process from brainstorming to polishing the final draft. This is a
  free service!
  - http://www.indiana.edu/~wts/

- Suggested general plan: First, write an outline that includes all the required parts of this
  assignment (See “Final project/plan must include:" on the previous page). Collect
  resources (textbook, etc.) and a few of your 6 required peer-reviewed journal articles. A
  good way to find these is to search the IU library’s database
  (http://www.libraries.iub.edu/) through “Resource Gateway.” They may be reviews of
  the birth defect, case studies, etc. Then start gradually filling in information within your
  constructed outline. If you follow this general plan your outline will naturally and quickly
  grow to become a decent rough draft. Leave it for a few days and come back to
  proofread, so you can see it with fresh eyes. Share your paper with other M300 students
  or people willing to look at it, reading aloud to help you catch mistakes you otherwise
  may not.

- Always keep in mind that compassion and empathy must be heard in your project – write
  in a way that explains the scientific facts clearly while not being brutal or pessimistic.
  Think of how you would want a nurse or physician to break this news to your family.

Consider going above and beyond by doing these types of things:
- Refer the parents to support groups or counseling services geared toward the specific
  birth defect. Provide details and contact information.
- Interview a family member or friend of a person with the same birth defect (or a
  physician, support group leader, etc.).
- If there are currently no preventative measures or treatment, hypothesize what the
  prevention or treatment could be in the future (can involve biochemistry, genetics,
  environmental reforms, etc – be creative!). If you want to go a step further and your
  birth defect already has preventions and treatments, then hypothesize more.
- Include images of people with the birth defect and label the common or hallmark features
  of these individuals.
M300: Human Birth Defect research project/plan
QUESTIONS TO GET YOU STARTED

A few questions that parents who know they are having a child with a birth defect may ask:

• What causes this condition?
• What are the signs and symptoms of this complication?
• How severe is this defect or disease? What are the long-term effects of this condition?
• What is the life expectancy of someone with this condition?
• How is this condition treated? What special care does a person with this condition require?
• Is there a cure for this condition?
• What other healthcare professionals should we see if our children have this condition?
• Will this condition improve or worsen over time?
• What tests are available to screen for or diagnose this condition? How accurate are the tests for this condition? What risks do the tests carry?
• Is this condition passed from one generation to the next? Can a person who doesn’t have this condition have a child who does?
• Are there organizations or support groups where I can talk to other people whose children have this condition? Do you have any information I can take with me to read?

http://www.pregnancy.org/article/questions-family-history-birth-defects
Backward course design: Step 3

Course Goals

Final Assessment

How will I know they have changed?

Learning Outcome
Learning Outcome
Learning Outcome
Learning Outcome

How will my students be different?

What must students be able to think and do to successfully complete the final assessment?

• Measurable and linked to student learning

http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php
Course Goals

How will my students be different?

Final Assessment

How will I know they have changed?

What must students be able to think and do to successfully complete the final assessment?

Learning Outcome

Example

- Define and identify the embryology vocabulary necessary to communicate effectively in this field.

- Communicate clear definitions of the birth defect from several reputable sources.

- Use these definitions and explain further using appropriate vocabulary.

- Perform the above tasks with the intended audience in mind.

http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php
Backward course design: Step 4

Course Goals

How will my students be different?

Final Assessment

How will I know they have changed?

Learning Outcome

Lectures, Class Activities, Readings, Homework

Learning Outcome

Lectures, Class Activities, Readings, Homework

Learning Outcome

Lectures, Class Activities, Readings, Homework

Learning Outcome

Lectures, Class Activities, Readings, Homework

What must students be able to think and do to successfully complete the final assessment?

What must students be able to think and do to successfully complete this learning outcome?

http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php
Course Goals

- How will my students be different?

Final Assessment

- How will I know they have changed?

Learning Outcome
- What must students be able to think and do to successfully complete the final assessment?

Learning Outcome
- What must students be able to think and do to successfully complete this learning outcome?

Lectures, Class Activities, Readings, Homework

- Insert content
- Plan course calendar

http://citl.indiana.edu/resources_files/teaching-resources1/teaching-handbook-items/designing-your-course.php
Student comments and experiences regarding the final assessment

• “It was a lot of work, but I got to learn a ton about my birth defect...was nice to have points that weren’t only from exams and tests.”

• “I appreciated that Keely let us choose our own topics.”

• “…got to pretend to be a healthcare professional, which made the project both interesting and relevant.”

• More engaged in the classroom

• Real-life relevance both professional and personal
References


Thank you!

Keely Cassidy, M.S.
kmccd@indiana.edu