

The Role of Instructional Design in Health Science Course Development

University of New England

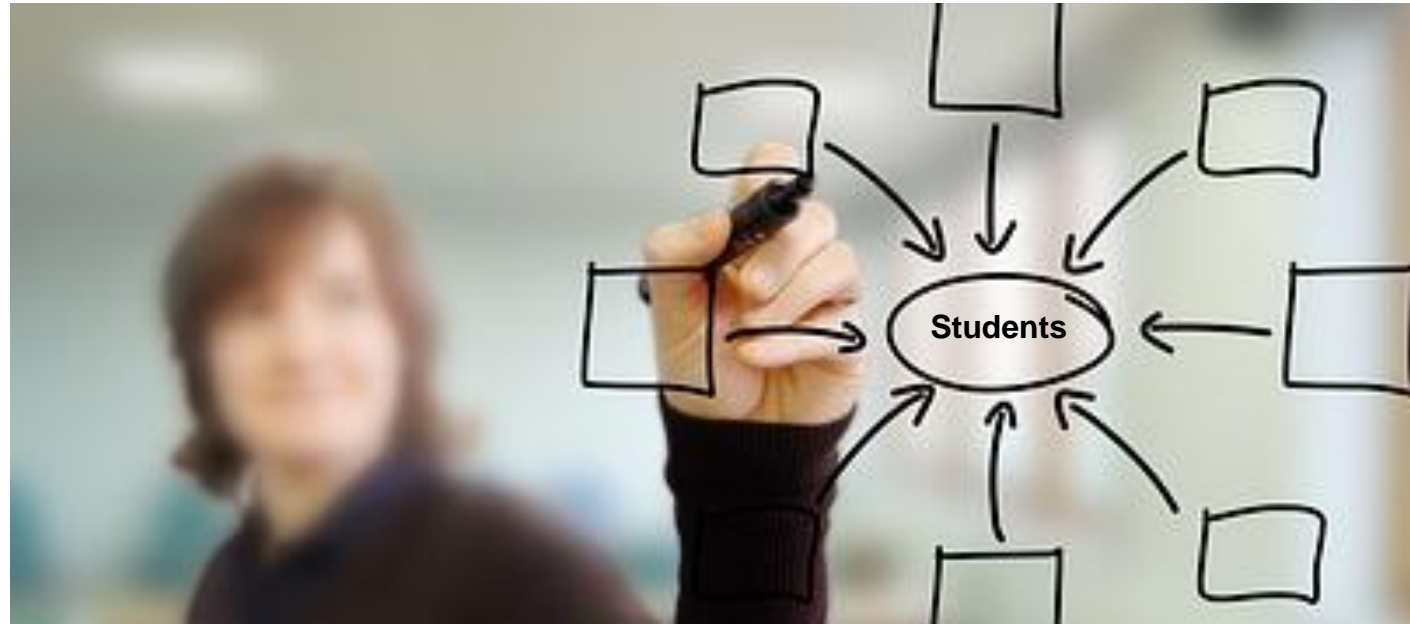
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Instructional Designers



Adult Learning
Course Design
Instructional Technology

Science Prerequisites for Health Professions SPHP

17 health science and math courses

Non-matriculated students

Fully online

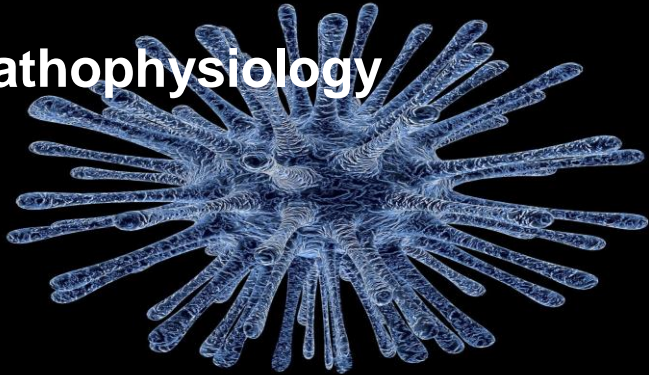
Self-paced

Asynchronous

16 weeks



Pathophysiology



Medical Physiology



Session Goals

Outline course development process

Discuss design challenges

Discuss strategies for active learning

Show the value of Instructional Designers

Illustrate research-based innovations

SPHP Course Development Process Overview

Subject Matter Experts

Medical Professionals

Teaching Faculty (offline)

Teaching Faculty (online)

Process Overview

32 Weeks (start to finish)

Curriculum Standards

Design and Development

Course Development Goals

Must be authentic/rigorous

- Pathophysiology = Pathophysiology

Challenges to authenticity/rigor:

- Defining the outcomes to make sure
Anatomy I = Anatomy I
- Designing activities and assessments
to authentically measure Anatomy I
learning outcomes

Outcomes and Authenticity



Backward Design in a Self-Paced Health Science Course

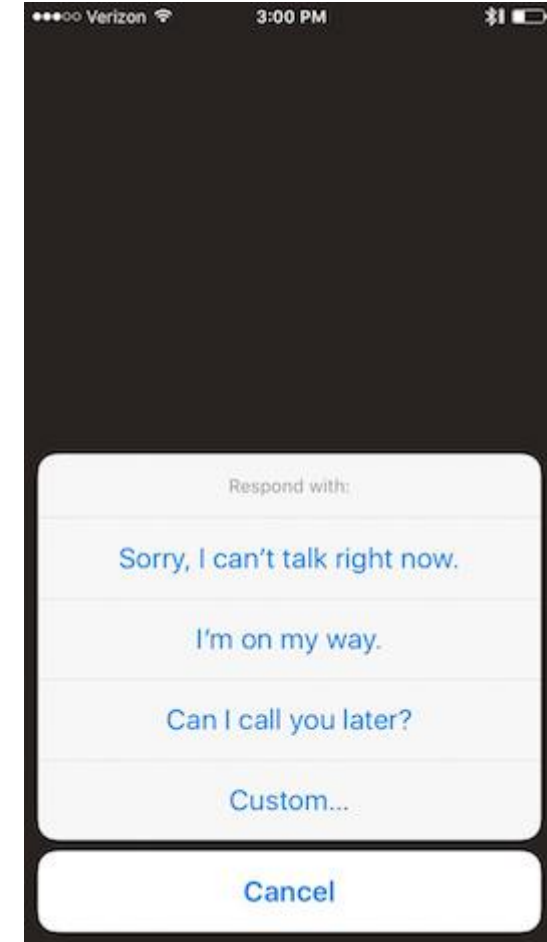


Challenges of Self-Paced: Customizable Experience

- Immediate Feedback
- Adaptive Release (Sequenced Progression)
- Self-Test and Practice Quizzes
- Study Guides



Challenges of Self-Paced: Peer Interactions

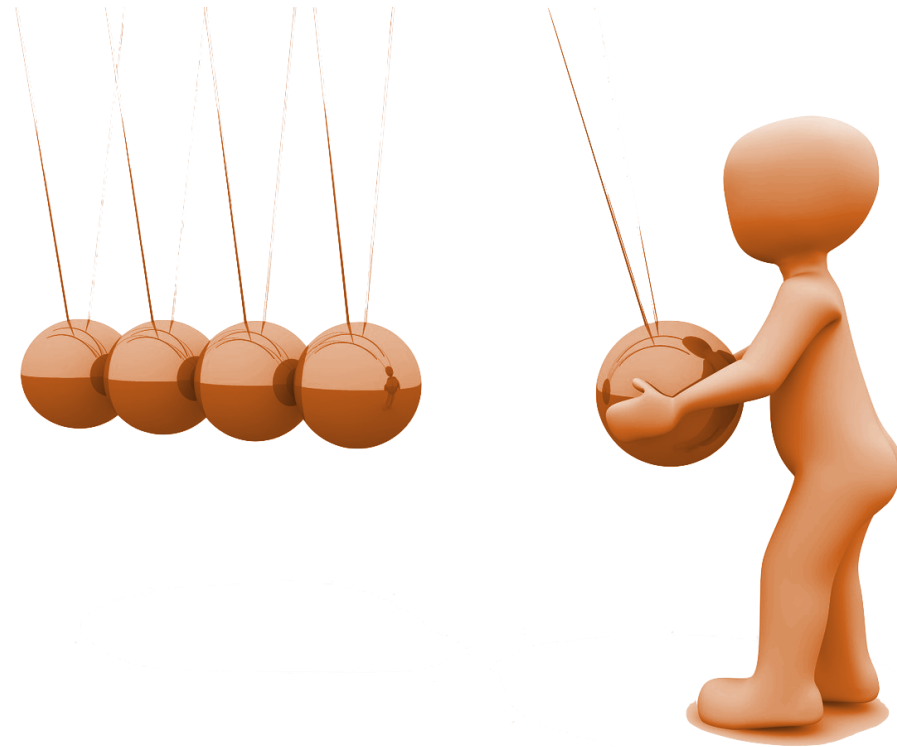


Challenges of Self-Paced: Time Management

- 16-week courses
- Suggested timeline in Syllabus and Course Modules
- Many students don't start at once, while others complete the course in a much shorter time
- Reminders about course pace in assignments



Challenges of Online Science Courses: Lab Experiences (Hands-on and Interactive Activities)



Engaging Activities



- Virtual, dynamic lab environments
- Physical lab experiments with materials delivered directly to students' houses
- Media-rich scenarios and case simulations
- Student presentations

PEx

Exercise 1: Cell Transport Mechanisms and Permeability > Activity 2: Simulated Facilitated Diffusion

Overview

Objectives

Introduction

Experiment

Lab Report

1. Note that the glucose carriers display in the membrane builder is set at 500.

Click Build Membrane to insert 500 glucose carrier proteins into the membrane.

The interface shows a simulation of facilitated diffusion across a membrane. Two beakers are connected by a U-tube. The left beaker contains a blue liquid and has a table of solute concentrations. The right beaker is empty. A membrane builder on the right allows setting the number of glucose carriers. Control panels for each beaker allow setting concentrations of Na⁺Cl⁻ and Glucose, and buttons for dispensing, flushing, and adding deionized water. A central timer is set to 60 minutes. A data table at the bottom records run numbers, solutes, and concentrations.

Solute	Concentration (mM)
Na ⁺ Cl ⁻	2.000
Glucose	3.000

Solute	Concentration (mM)
Na ⁺ Cl ⁻	0.00
Glucose	0.00

Membrane Builder: Glucose Carriers 500

Na⁺Cl⁻ (mM): 2.00, Glucose (mM): 3.00

Na⁺Cl⁻ (mM): 0.00, Glucose (mM): 0.00

Avg. Diff. Rate (mM/sec)

Timer (min): 60

Run Number	Solute	Start Conc. L	Start Conc. R	Carriers	Rate
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Record Data

Back Next

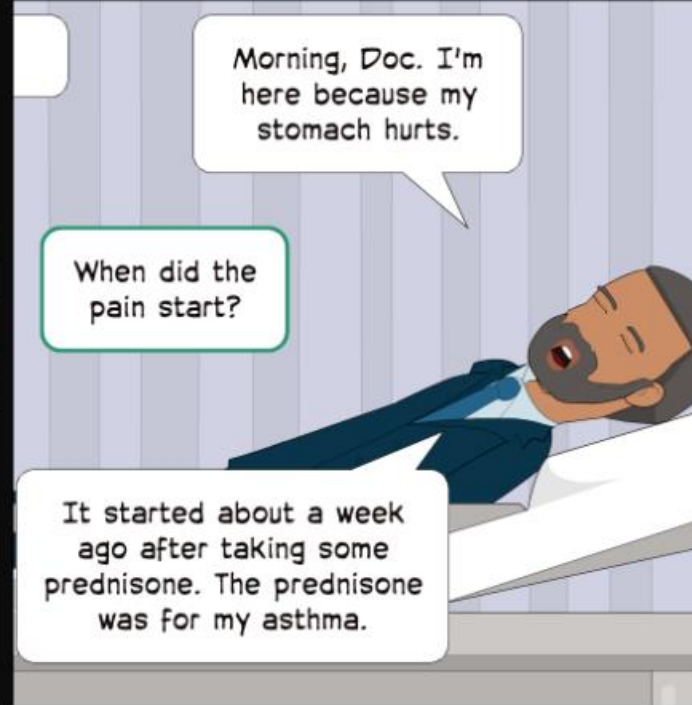
Undo

Reset

Submit



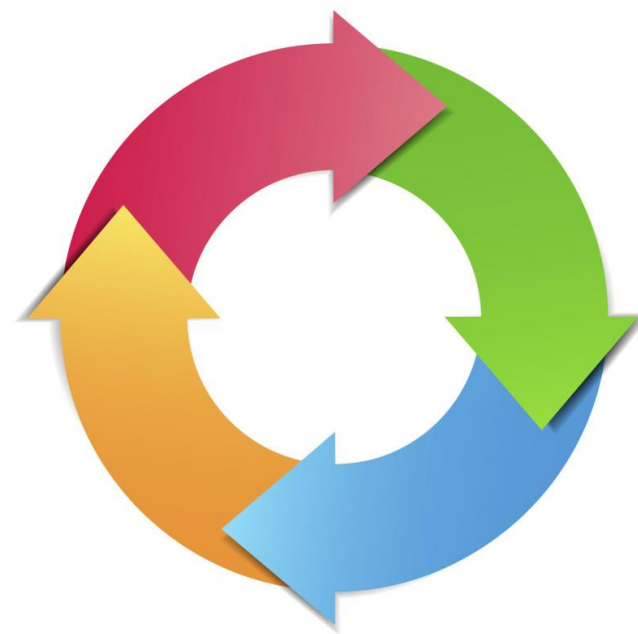






Continuous Development Cycle

- Redesigns as opportunity for innovation
- Educational Technologist role
- Innovative research based solutions



Examples

- [Memory Palaces](#) and the Method of loci
- [Virtual Reality and 3D Space](#)
- Interactive Narratives



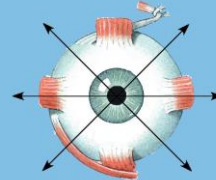
Macula

The light-sensitive layer of tissue lining the interior of the back of the eye





Eye Movements & Eye Muscles

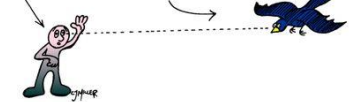


REFRACTIVE ERRORS

* Myopia - "My" = Nearsightedness
Can See Near.



* Hyperopia - "Hy" (High) = Farsightedness
Can See Far. (Presbyopia)

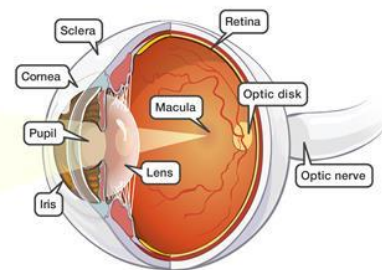


* Astigmatism -
BLURRED AT ANY DISTANCE.

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Closet

Utility



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Extraocular muscles cranial nerve innervation

LR6-SO4-R3

- Lateral Rectus is 6th CN
- Superior Oblique is 4th CN
- Rest are all 3rd CN



www.medical-institution.com



Immerse - Setting up the default system for the Immerse components in this scene on the Canvas (1) camera





Questions?

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