



XR-FLC Course Redesign with XR Pilot Report (Template)

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Course Information

Course NO. & Name	BIOL144L-Neuroanatomy lab
Course Description	This course is designed to present and explain basic organization of the brain and its functional anatomy. There is a primary focus on macroscopic organization of the human brain, but it also discusses some comparative neuroanatomy in other vertebrates. The objective of this course is to give a broader perspective of how the nervous system is organized, with emphasis on the human brain and its function.
Significance to Major	Required
Course Prerequisite(s)	BIOL 33 or 67a or 67b or 103 or 162
Course Level	Upper-division
Course Enrollment	18 students
Course DFW Rates	SP21 0%, SP22 0%



Redesign Specifications

Scope of the Redesign	I have redesigned last part of the class: research projects. Instead of having students to develop project on one of the nervous systems and do comparative research on different animal models, students had to explore VR app and create project on available data sets and present it at the class.
XR Technology Selected	VR Headsets
XR Devices Selected	Oculus Quest
XR Application(s) Selected	syGlass. Custom designed app was given us for free with 3 different data sets and in total 20 licenses for a 30 day use
Total Course Redesign Time	10+ hours



Active Learning with XR

Learning Activity Description	<ul style="list-style-type: none"> - Self-guided tour to the sy-Glass program of 3D scanned brain. - Review of tutorials and tools available in the program - Project development based on what they have available and what they can do with data - Narratives documentation, video recording of the project, presentation
Learning Objective(s)	<ul style="list-style-type: none"> - memorize and recall the brain structures - label and measure structures - outline neural system pathways - make list of useful information that can be gathered and use syGlass program
Specific Active Learning Pedagogy	Semi-guided tour through the syGlass
Activity Logistics	Students had and outline of what is going to be done during each class
Activity Duration	5 class time, in total 25 hours
Availability of TA?	No
Availability of Tech Support?	No
Total Instructional Time Committed	25 hours of class time + (10+)hours of project design



Learning Assessment

Direct Assessment	
Formative	Lab project, Quiz
Summative	Lab practical
Indirect Assessment	
Formative	Discussion and project presentation
Summative	pre and post evaluation survey



Pedagogical Impacts of XR

- Directly contribute to the project research questions
 - How students learn differently with XR-enhanced active learning
 - Scenario 1: Control vs. Experiment
 - Scenario 2: Pilot vs. Pre-intervention
 - How different students learn with XR-enhanced active learning
 - Examine student performance with intersectionality
 - Gender, ethnicity, first-generation status, social-economic status
- Constitute as the **Minimum Reporting Requirement**
- **Raw data in the format of excel, csv, or word**



Pedagogical Impacts of XR: Direct Assessment Data

Scenario 1: control vs. experiment

ID	Ethnicity	First-Gen	Pell Grant	Gender	...	Score
C1						S1
C2						S2
C3						S3
C4						S4
C5						S5
C...						S...

ID	Ethnicity	First-Gen	Pell Grant	Gender	...	Score
E1	Hispanic					S1
E2	Asian					S2
E3	African-American					S3
E4	Hispanic					S4
E5	White					S5
E6	Hispanic					S6
E...	...					S...

One-Way ANOVA

Independent t-test



Pedagogical Impacts of XR: Indirect Assessment Data

- Surveys, interviews, and focus groups can reveal in-depth issues related to learning gaps that test scores cannot
- Standard instruments and benchmarks are coded and usually can provide additional quantitative data (*sample instruments in Canvas course shell*)
- Interview and focus group transcripts using content analysis and thematic analysis can help understand patterns



Additional Reporting Materials

- Course syllabus (pre- and post-redesign)
- Filled Backward design templates
- Photos and audio/video recordings showcasing student interaction with XR
- Other valuable research and marketing vignettes