

# *Giving Microbes A Second Life*

*How Can A Virtual Microbiology Laboratory Experience Improve Learning?*

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**OUR LADY  
OF THE LAKE  
COLLEGE**

*Louisiana's leader in Catholic healthcare higher education.*

# Overview

- Microbiology course demographics
- Concept of a 2<sup>nd</sup> life micro lab
- Process (from start to finish)
- Assessment
- Concept Map of Project
- Questions/Comments

# Micro at the Lake

- The Fundamentals of Microbiology course is required in admission for all clinical degree programs offered by the College (~80% of total enrollment)
- The majority of students are also required to enroll in the micro lab course
  - Concepts are typically covered in tandem.
- Meets the laboratory competency component of the general education curriculum
- For many of our students, this will be there only wet lab experience prior to clinical program admission.

# Micro Course Assessment

- Primary assessment instruments indicate that 4 of 5 course learning outcomes failed to reach acceptable benchmarks
- Student survey data indicates a lack of student engagement in the sciences
  - 43% of students surveyed reported that OLOLC contributed “little” or “not at all” to their development in working effectively with modern technology, like computers.
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# Virtual Microbiology Labs

- Various VML experiences are currently available online
  - [HHMI](#)
  - [Univ. of Utah Learn Genetics](#)
- **Opportunities:** someone has done the work for us!
- **Problem:** how to adequately assess student learning using these exercises?
  - [Inability to populate significant data](#)



# The Origin of 2<sup>nd</sup> Life at the Lake

- Summer 2008: 2<sup>nd</sup> life island purchased and faculty think tanks generated by Administrative assessment of computer-based technology, leading to generate multiple endowment proposals
- Pilot programs currently in development or implemented:
  - Physician's Assistant (ABG interpretations)
  - Plato's Cave
  - St. Francis Museum

# 2nd Life in Education

- Educational institutions have begun using Second Life to formulate various educational networks devoted to specific fields
  - Education
  - Computer programming
  - Liberal Arts
  - Physical Sciences
- Opportunities: Moodle integration (SLoodle)
- Problem: Where are the natural science modules?



Ohio University's virtual campus seen from above

# The Concept of a Home-Grown 2nd life Virtual Micro Lab

- Primary assessment data indicates that courses are deficient in inquiry-based scientific exercises
- Secondary assessment data indicates that students are not engaged in scientific coursework
- Current program curriculums are deficient in laboratory and computer-based coursework
- Course-level assessment data collection is cumbersome due to current technological resources

# Project links to Assessment

## Strata



### Institution

- *enhance knowledge and thinking in support of further study and advanced education in the health sciences*

### Program

- *computative competency*
- *natural science competency*

### Course

- *Analyze integrative, conceptual topics in microbiology*

# The Process: Step One

- Within the first weeks of course, lectures and readings focus on microbial cell composition and microscopy.
- In-class training on the 2<sup>nd</sup> life platform
- Students will create an avatar for 2<sup>nd</sup> life and be granted access to the College's virtual island
- Students will be asked to locate the island's hospital.



# The Process: Step Two

- Students are distributed numbers that are tagged to a specific, but unknown blood-borne bacterial pathogen.
- When students identify the patient room, they will move the cursor towards the patient.



# The Process: Step Three

- Once the cursor makes contact with the patient, a case study appears on the screen.
- This information act as a supplementary aid for correct diagnosis .
- Students are then instructed to walk their avatars to the virtual micro lab.
- Med term questions are linked to this interface to assess A&P retention.



Second Life

Me Communicate World Build Help

L\$ 26,579 BUY L\$ 7:43 AM PST

Our Lady of the Lake College Island, OLOL College Island - General

Search

Favorites Bar

MEDIA BROWSER

Back Forward Reload <http://doceo.ololcollegenet.org/public/chart.php> Go

Send Current Page to Parcel

**Personal Information** **Patient History**

 **Name:** Smith, Jane  
**Age:** 65  
**Weight:** 130 lbs.  
**Height:** 5 ft 6 in  
**Race:** Black  
**Religion:** Catholic

A 65 year old female arrives at the hospital with a 2-week history of low grade fever and general fatigue. She was taking acetaminophen to relieve the fever. Initial physical examination showed an oral temperature of 102°F, blood pressure 100/50 mmHg, regular pulse at a rate of 104 beats per minute and respirations of 34 per minute.

**Vitals** **Physical Exam**

**Temperature:** 102  
**Blood Pressure:** 100/50  
**Pulse Rate:** 104  
**Respiratory Rate:** 34 per minute

She also noted myalgia and arthralgia. There was no sign of diarrhea or vomiting. She has recently noticed a painful nodule at the tip of one of her fingers. She reported that she had a tooth extracted 4 weeks prior to symptoms.

**A blood sample was obtain from Ms. Smith and taken to room lab 101 on the second floor. Go there to evaluate the results of the sample.**

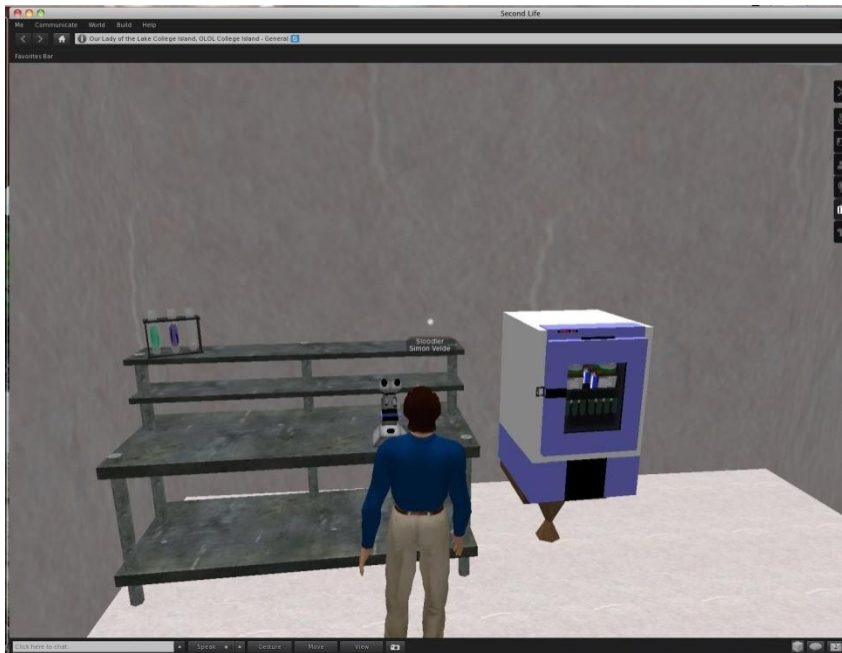
Open in My Web Browser Always open in my web browser Close

Click here to chat Speak Gesture Move View



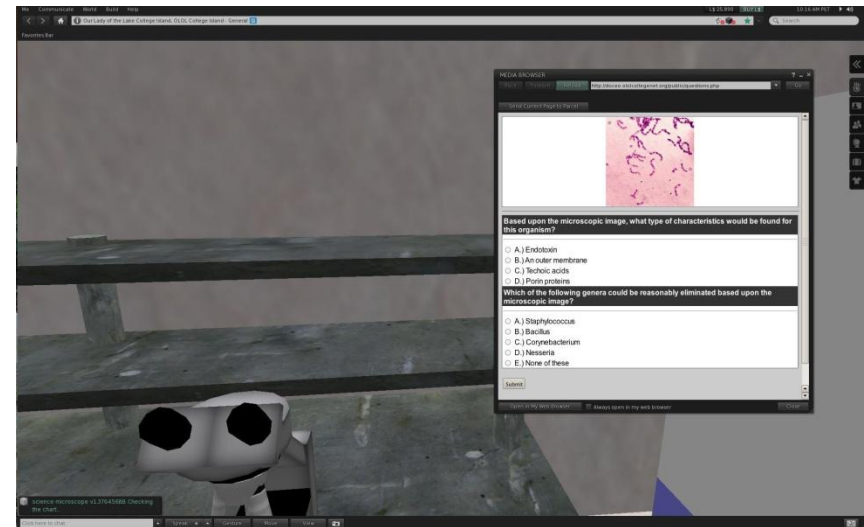
# The Process: Step Four

- Once in the micro lab, the students enter a designated room (based upon their patient).
- Scrolling the cursor over the microscope results in the appearance of integrated questions.



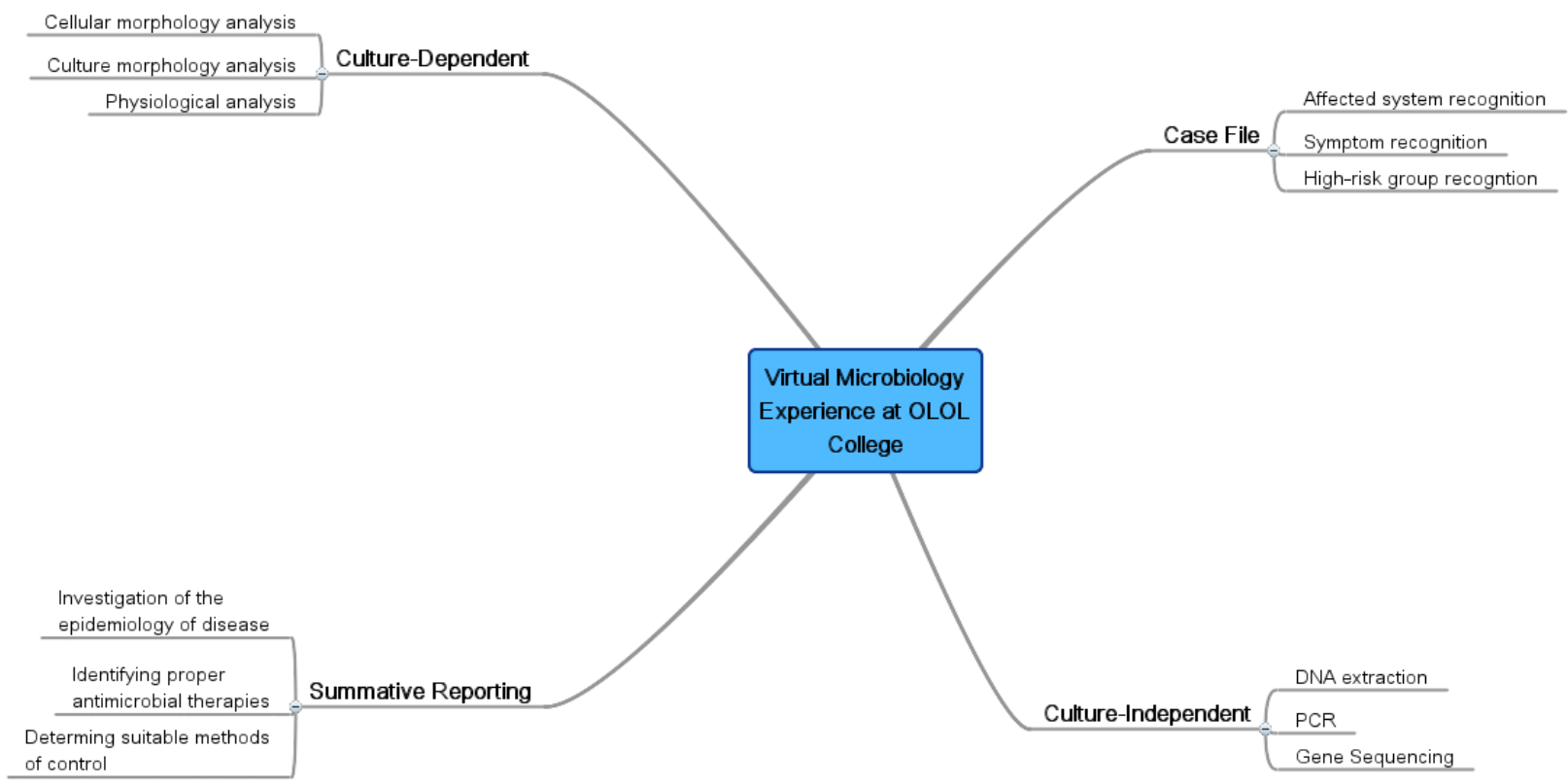
# The Process: Step Five

- The questions correlate with current lecture content
- Questions synthesized to assess significant learning
  - **Inquiry-based**
- Questions are formatted so populate student answers
- In some cases, students cannot proceed until they answer correctly
- Instant feedback allows for lecture course adjustments



# Student Workload

- **Early-semester:**
  - One class period to be used to train students on registering and using Second Life
  - Cases distributed to students
- **Mid-semester:**
  - Laboratory exercises completed and assessed, in tandem with wet lab exercises. Eight 15-minute classroom discussions on the exercises.
- **Late-semester**
  - Summative written submission on the experience
  - One 30 minute classroom discussion on the assignment
  - One 60 minute classroom discussion dedicated to reflection
- **Total estimated classroom time: 3.5 out of 30 classes**



# Questions for the Audience

- Do you feel that this model is an appropriate exercise for a introductory microbiology lecture course (science + non-science majors)?
- Is this exercise too “nifty” for its own good?
- Is the allotted classroom time dedicated to this experience appropriate?
- What additional learning objects could be inserted into this platform?