**Presentation Overview**

- Introduction
- Simulated case studies as a learning tool
- Demonstration of educational simulations
- Clinical simulation research study
- Research results/conclusion
- Applications for clinical education simulations

**The Most Important Skills...**

- What are the most important skills a student can have, across professions even in technical fields such as engineering, medicine or communication disorders?

**The Most Important Skills...**

- Leadership
- Communication
- Nurturing/Stewardship
- Decision making/Analytical
- Innovation/Adaptation
- Teamwork/Collaboration
- Negotiation

**Traditional Clinical Education**

- Classroom

**Traditional Clinical Education**

- Books & Workbooks
Traditional Clinical Education

Web Pages

Role-Play

Case Study

But Clinical Education is...

Learning to DO

NOT just Learning to KNOW

......Because you can't learn to ride a bicycle from a book

Or interact and treat patients from the WWW...
The 4 Pillars of Education

- Learning to Know
- Learning to Do
- Learning to Be
- Learning to Live Together

Simulation Technology

Simulation: A New Competency

“Simulations can teach some things well, but not everything at once – choose your battles”

Stuart Moulder – former GM for Microsoft Games

Simulation: Situational Awareness

The ability to filter out certain details and highlight and extrapolate others, to better understand and control the outcome.

Aldrich, C 2009

Simulation: Situational Awareness

Most formal learning programs to date, using classrooms and traditional media do not develop situational awareness in their students.

Aldrich, C 2009

Simulations: Situational Learning Paradigms

Aldrich, C 2009
Branching Story Structure

Using an Educational Simulation

It's Not What You Think....

“An inexperienced learner is thrown by frustration, but a good learner uses it”

Carol O’Conner

Simulation Examples

Simulations for Communication Sciences & Disorders??????

CSD Simulation Examples

SimuCase™: Virtual Patient Simulations

Design a simulation program for CSD:
• Applicable to all levels of students (undergraduate/graduate)
• Standardized scoring algorithm
• Non-linear sequence with multiple outcomes
• High degree of interactivity & immersion
• Fun & challenging

http://www.youtube.com/watch?v=HfFd5GyTJJo

http://www.youtube.com/watch?v=jH3hiCfnmPM

http://www.youtube.com/watch?v=HfFd5GyTJJo
Other CSD Simulations

- SimuCase™—BETA phase
- Second Life—virtual world software
- Virtual Case Creator - software that supports highly interactive, student led, virtual patient and practice online simulations
- My Virtual Child—an interactive simulation that offers students the opportunity to act as a parent and raise their own virtual child. By making decisions about specific scenarios.
- DVD Simulations
- Standardized Patients
- Custom Simulations - through existing e-learning platforms such as WebCT, Blackboard

Using Educational Simulations

- Instructor-Supported
- Stand-Alone

Why aren’t simulations used more?
- Lack of money and funding
- Lack of time
- Lack of knowledge
- Lack of technology
- Lack of sharing

Bust the Simulation Barriers

- Think of simulations as a resource
- Use simulations not to invade teaching time but to make better use of it
- When technology is unavailable, try non computer simulations
- Educate yourself
- Remember exams can be simulated

Simulations: Keys to Success

The goal of clinical simulations is to stimulate the creation of mental models within the learner by having them discover rules and principles through experimentation. Instructors should constantly be asking themselves, “How do I help the learner discover this principle and then verify that they know it?”

James Hadley, IT designer at JHT Incorporated
Consider this...

- 53% of 0-8 year olds have access to mobile digital media devices
- 11% use digital devices daily for an average of 43 minutes a day
- 90% of 5-8 year olds have used a computer
- Children spend 13 hours a week playing video games

www.commonsense.org/research

What’s the use?

- Assess student competencies
- Low-risk student training
- Access to low-incidence populations

As we go forward

What is the most effective pedagogical use of simulations?
How do we determine the successful use of simulations?

Background Information

- Diagnostic Teaching Model at SXU
  - Diagnostic course (4 hours) second semester of the first year
  - Participation in 5 – 7 diagnostic evaluations in our on-campus clinic, with clients of various ages exhibiting a variety of disorders
  - Students have completed 2 semesters of on-campus clinical practicum

Student Diagnostic Evaluations

- Participate in 2 evaluations in May, August, December
  - First evaluation paired; pass-fail
  - Remaining evaluations completed independently; rated and graded
Challenges of Existing Model

- Providing a sufficient number of evaluation experiences to ensure student competency
- Providing evaluation experiences with a variety of clients and disorder areas
- High stress levels due to inexperience in assessment
- Supporting students who struggle to gain competence in assessment skills
- Supervisor concern about adequate student preparation

Solutions

- Increase in the amount of direct instruction
- Increase in the number of diagnostic experiences per student

These solutions increase the demand on the clinical program!

Pilot Study Objectives

- Identify which competencies are likely to be impacted by use of educational simulations
- Determine reliable measurement of clinical competencies
- Explore various application of simulations within CSD clinical education

Student Participants

First year graduate students enrolled in the SLP program at St. Xavier University
Self-selected, sample of convenience
N=16, 8 enrolled in course, 8 matched for clinical hours

<table>
<thead>
<tr>
<th></th>
<th>Treatment Group</th>
<th>Non-Treatment</th>
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<tbody>
<tr>
<td>Diagnostic Hours</td>
<td>Average = 94.1</td>
<td></td>
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<tr>
<td></td>
<td>Range = 36-170</td>
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<tr>
<td>Overall Clinical Hours</td>
<td>Average = 94.8</td>
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<tr>
<td></td>
<td>Range = 38-173.5</td>
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Pilot Study ABA Design

Student Self-Assessment Questionnaire

Feel confident in...

- Communicating with client, caregivers, or other professionals, as appropriate, and generating investigative questions
- Appropriately responding to questions and concerns from the client, caregiver or other professionals

4 Point Likert Scale

Pre/post ratings for 21 diagnostic competencies identified from ASHA Knowledge and Skills

Strongly Disagree, Slightly disagree, Slightly Agree, Strongly Agree
Diagnostic Sessions

- Specific instructions given to clinical supervisors to ensure uniform procedures and facilitation of student independence
- All diagnostic evaluation sessions recorded on DVD

Intervention

- Elective course: Assessment II (1 credit hour)
- Utilized Simucase technology to supplement traditional learning experiences
- Independent repetitive work on online cases combined with classroom experiences where students could discuss performance, receive feedback, discuss the issues of the case, and receive “the answer”

Intervention

- Class discussions aligned with Simucase tasks:
  - Collecting intake information from a variety of sources
  - Choosing appropriate formal and informal assessment measures
  - Analysis of test data
  - Diagnosis of disorder
  - Treatment recommendations and specific goals

Intervention

- Eight participants
- The course consisted of five meetings in July
- 1st meeting: training and work a case together
- Two weeks to independently complete the remaining four cases
- Meet for one class per each remaining case
- Students wrote a diagnostic evaluation report for the last case, aligned with SXU format

Intervention

- Disorder areas of the cases were chosen based on the graduate coursework that students had already completed
  - Language
  - Articulation/phonology
  - Fluency
- For grading purposes students submitted completed cases via PDF printouts with scores

Intervention

- Learning occurred in a situation opposite of that of the high-stakes diagnostic practicum:
  - Students could start and re-start cases as often as they liked
  - They were able to collaborate and receive answers to their questions during the assessment process
  - Engagement in discussions of pros and cons of various assessment choices
  - Students were presented with the opportunity to change their diagnosis and treatment recommendations
Post-Intervention

Course Evaluations
Student Self-Assessment of Clinical Confidence
Individual diagnostic evaluation

Student Course Evaluations
- Students reported:
  - alternate mode of learning beneficial
  - were able to gain experience with a greater variety of cases and disorder areas than in traditional practicum experience
  - liked the blended format of independent online simulated cases followed by group discussion
  - appreciated the knowledge they gained about work sites different from the university clinic
  - would definitely take another class utilizing the same format

Course Instructor Feedback
- Course instructor reported:
  - the course expanded the diagnostic experiences available to students
  - students were able to engage in "process" discussions of diagnostic evaluation that they were not able to in traditional practicum experiences
  - students were provided with the opportunity to deliberate the pros and cons of various assessment decisions
  - students benefitted from the ability to "re-do" diagnostic evaluations

Course Instructor/Student Feedback
- Students reported technology-related glitches (which were all very quickly resolved)
- The course instructor made some modifications to the scoring system for each case

Results of Self-Confidence Survey
Pre-/Post Survey for Treatment Group
No significant difference
(N= 8; Wilcoxon Signed Rank)

Post Survey Treatment versus Non-Treatment Group
No significant difference
(N=26; Mann-Whitney U)

Ending/Wrap UP
- Possible increased student confidence
- Increased experience with a variety of disorders, age, and ethnicities
- Practice with a greater variety of assessment instruments
- Greater competence in analyzing both formal and informal assessment results
- Improved ability to diagnose and make therapy recommendations
Ending/Wrap Up

- Challenges
  - Reliability of student self ratings
  - Reliability of supervisor ratings

Implications

- The use of interactive learning tools as a possible alternative means of accruing clinical hours and KASA competencies for clinical skills
- Many programs are under pressure to increase the number of students in their programs while simultaneously maintaining a diverse clinical population on campus and a sufficient number of external placements to allow for completion of KASA competencies

Additional Considerations

- CAPCSD is currently surveying members to determine the use and acceptability of a variety of means of clinical education in addition to traditional face-to-face diagnosis and treatment.
- Alternative forms of clinical education are already standard practice in other disciplines, particularly in the medical field.
- There is an identified need for further research to confirm the efficacy of using alternative forms of clinical education in our discipline.

Future Directions

- Research Project 2012-2013: Continued study of SimuCase as a clinical teaching tool for Communication Science & Disorders Programs
- Increased number of subjects
- Expansion of competencies measured
- Questions???

Book & Research Journals