The Feasibility of Using 3-D Virtual Environments in Distance Education

Constance M. Johnson, Ph.D., R.N.
Kirsten Corazzini, Ph.D.
Duke University School of Nursing

Funded in part by Duke University CIT
The Duke School of Nursing Experience

- Grant – Center for Instructional Technology
- Built a Second Life Infrastructure
- Developed orientation resources and procedures that optimize student and faculty participation
- Developed policies and procedures for student and faculty conduct in SL
- Explored student perceptions of learning using Bb, Elluminate and SL
Hi Bertha Schoomantal! Touch me for Menu. Say /1a
Hi Ka Kesslinger! Touch me for Menu. Say /1a to Adjust.
where did everyone go?
Cindy we are in the classroom
Figure 1-1
Systems Life Cycle Models

A Request and Initiation  Planning  Closure
B Inception  Elaboration  Implementation  Maintenance
C Needs Assessment/System Selection  Design  Development  Support
D Analysis  Concept  Detailed Analysis & Design
E Identify need and explore solution  Define system requirements  Match system with business process
  System produced  Host

Select an Animation:
Current: two legs up

just sit  mens sit  one leg up  recline
  sit bored  two legs up  vote  ignore
Methods: Sample

- Ten students enrolled in an on-line graduate nursing course employing the following instructional modalities:
  - Blackboard
  - Elluminate
  - Second Life
Methods: Measures

- Self-administered survey instrument
  - Researcher-developed
  - Completed by students following each instructional modality
  - Included perceptions of learning from 9 learning and instructional technology domains
    - close-ended survey scales for each domain
    - open-ended question for each domain
Scale Domains

- Overall assessment of learning environment
- Perceived quality of assignments
- Perceived quality of information provided to learn content
- Perceived quality of class resources
- Perceived quality of learner support
- Self-rated gains in content comprehension
- Self-rated gains in integrating content
- Self-rated gains in critical assessment of content
- Perceived impact on attitudes towards content
Methods: Analyses

- Descriptive statistics of each domain scale
- Bivariate statistics of domain scale by instructional modality
  - One-way Analysis of Variance
- Open coding of open-ended questions for all domains
  - Identification of emergent themes
Results: Measures

- Adequate reliability for 6/9 scales ($\alpha > .70$)
- Scales results across all instructional modalities

<table>
<thead>
<tr>
<th>Scale (1=low – 4=high)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall assessment of learning environment</td>
<td>3.5</td>
<td>.52</td>
</tr>
<tr>
<td>Quality of information provided to learn content</td>
<td>3.6</td>
<td>.45</td>
</tr>
<tr>
<td>Quality of class resources</td>
<td>3.5</td>
<td>.54</td>
</tr>
<tr>
<td>Gains in content comprehension</td>
<td>3.7</td>
<td>.48</td>
</tr>
<tr>
<td>Gains in critical assessment of content</td>
<td>3.4</td>
<td>.60</td>
</tr>
<tr>
<td>Impact on attitudes towards content</td>
<td>3.6</td>
<td>.50</td>
</tr>
</tbody>
</table>
Results: Quantitative Analyses

- One-way ANOVA of scales by modality
  - $\alpha<.10$, Bonferroni correction for multiple comparisons

- Differences by modality for:
  - Overall assessment of learning environment
    - Second Life rated higher than Blackboard
      - $P<.10$, post-hoc Tukey
      - Elluminate not significantly different
  - Perceived quality of information provided to learn content
    - Second Life rated higher than Blackboard
      - $P<.10$, post-hoc Tukey
      - Elluminate not significantly different
Mean Overall Assessment by Modality (N=10)
Mean Perceived quality of information by Modality (N=10)
Overall Comments on BlackBoard?

- “Early on when I did not have any contact with my classmates, I sometimes found the discussion board to be intimidating. I usually don’t have any problem participating in a class discussion, but this format decreased spontaneity and lively discussion.”

- Bb is convenient for its display of class content.
Themes in Blackboard

- 44 responses
- Asynchronous learning – positive aspect (n=17)
- No interaction – flat communication (n = 13)
- Confusion (n = 4)
- Isolation (n = 3)
- Tech challenges (n = 3)
- Tech dimensions good (n = 2)
- Good resources (n = 2)
Overall Comments on Elluminate?

- I appreciate the small amount of interaction that occurs in the Elluminate session, even though there are many technical problems and only four people can talk at one time, it is preferable to the lack of real time interaction of Bb.

- I found it difficult to manage all the activity that was occurring at the same time, i.e. discussion, instant messaging, etc…
Themes in Elluminate

- 24 responses
- Technical challenges (n = 12)
- Real time exchanges supports learning (n = 7)
- Tech dimensions good (n = 3)
- Too much ongoing activity (n = 2)
Overall Comments on Second Life?

☐ For me SL is extremely effective
☐ SL helps clarify subjects at times
☐ Classroom discussions are more spontaneous
☐ SL helped with interaction with others
☐ Greater participation in Second Life
Themes in Second Life

- 16 responses
- Real time exchanges supports learning (n=11)
- Technical challenges (n = 2)
- Technical dimensions good (n = 2)
- No distractions (n = 1)
Student Lessons Learned

- Feasible environment for teaching and learning
  - Spontaneous communication – lively and interesting discussions
  - A sense of belonging in a course through interaction
- Creation of individual avatars – fashion in own likeness
  - Preserved a consistent self-concept
- Students experienced a sense of belonging – an academic home
- Alleviate feelings of isolation experienced with some distance courses
- Creation of virtual DUSON – catered to the need for the predictable, familiar, and stable
Faculty Lessons Learned

- Educational strategies need to be planned
- Further study on simulated environments
- Opportunity to create 3D models for demonstration
- Opportunity to create clinical scenarios and labs for practice
- Mimic classroom environment including naming and clothing conventions
- School is closed environment – griefers
- Names over avatars
- Spend time in SL to understand the environment
- Technology can be problematic
Summation

- Second Life is not a game
- Surrogate for real world classroom
- Allows experiential learning and synchronous interaction
- Promotes social interaction
- Supports immersion and presence
  - Real time teaching and discussion
  - Enhances instructor/student relationship
- Teaching and Learning enhanced with
  - Content authoring tools
  - Virtual environments/webinars
Future Directions

- Evaluate effectiveness of teaching and learning
- Building clinical labs
- Students gaining programming experience in Informatics program
- Start building sites for interaction between patients and providers
What is Iterative design?
How does incremental design differ from iterative?
Define waterfall design.
Explain system lifecycle models.

Questions

http://www.youtube.com/watch?v=sL3D-59MbnY