Interactivity, Engagement, and Increased Learning Outcomes in 3D Virtual Worlds

by Kay L. McLennan, Ph.D.
Professor of Practice
Tulane University

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What is a 3D virtual world?

A sophisticated computer program that simulates a landscape like a college campus or Louisiana swamp.
Why are 3D virtual world simulations important to online learning?

**Virtual world simulations:**

- Are intrinsically immersive and engaging;
- Can facilitate simulations that are too dangerous or impractical to stage in real life;
- Simultaneously supports both remedial and enrichment learning;
- Are cost effective; and
- [Once mastered] Are easy to use and almost infinitely customizable.
Why are virtual world learning activities important to students?

Students say:

• I think it is an awesome addition. I love the idea of real time discussions.

• This is my second experience in the virtual world and I think it should be offered in every class. It makes the class more interesting.

• ...The virtual world presentations were more interesting and caused me to "want" to read and learn. I found myself wandering into other buildings [not related to my class] where I discovered and learned [from different course simulations].

• Keeping studies interesting is a factor that will lead to a higher success rate. I see this evolving into something great for education at Tulane and other forums.
How are virtual worlds in e-courses?

• Participation is voluntary.

• Virtual world simulation activities include an assortment of asynchronous and real time learning activities.

• Students provide feedback on the different simulations (re: interactivity, engagement, and contribution to learning).

• Student feedback is used to improve virtual world builds.
# Quantifying Engagement*

<table>
<thead>
<tr>
<th>Engaging?</th>
<th>Likert Agreement Scale 5 to 1 (see below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom delivery...</td>
<td>3.5</td>
</tr>
<tr>
<td>e-Course delivery...</td>
<td>4.1</td>
</tr>
<tr>
<td>Virtual world delivery...</td>
<td>4.4</td>
</tr>
</tbody>
</table>

* Only students that self-select themselves for online and virtual world learning were surveyed.

**Likert Agreement Scale**

- 5.0 = Strongly Agree;
- 4.0 = Agree
- 3.0 = Neither Agree or Disagree
- 2.0 = Disagree
- 1.0 = Strongly Disagree
Interactivity, Engagement, and Increased Learning by Instructional Delivery Method

--- Correlation Coefficients ---

<table>
<thead>
<tr>
<th>Delivery Method</th>
<th>Interactivity + Engagement</th>
<th>Engagement + Increased Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom delivery...</td>
<td>0.77</td>
<td>0.47</td>
</tr>
<tr>
<td>e-Course delivery...</td>
<td>0.71</td>
<td>0.79</td>
</tr>
<tr>
<td>Virtual world delivery...</td>
<td>0.72</td>
<td>0.87</td>
</tr>
</tbody>
</table>

*Learner = Self-selecting virtual world participant non traditional (28 years old on average) students; n = 8.

Correlation coefficient values between 0 and 0.3 (or 0 and -0.3) indicate a weak positive (or negative) relationship. Correlation coefficient values between 0.3 and 0.7 (or -0.3 and -0.7) indicate a moderate positive (or negative) relationship. Correlation coefficient values between 0.7 and 1.0 (or -0.7 and -1.0) indicate a strong positive (or negative) relationship.
3D Economic Models:  
- Interactive – 4.4  
- Engaging – 4.4  
- > Learning – 4.4

Free Trade Game:  
- Interactive – 4.0  
- Engaging – 4.0  
- > Learning – 4.0

Dioramas:  
- Interactive – 4.2  
- Engaging – 4.2  
- > Learning – 4.2

My Picks Versus...
Meet the Economist:
• Interactive – 4.6
• Engaging – 4.6
• > Learning – 4.6

Gender Dynamics:
• Interactive – 5.0
• Engaging – 5.0
• > Learning – 5.0

In-World Resources:
• Interactive – 5.0
• Engaging – 5.0
• > Learning – 5.0

... My Student’s Picks*

* Includes the “Dark Horse” or Unexpectedly Highly Rated Simulations
Best Practice: Layered Simulations

Layers in the Prototype include both real time and asynchronous learning activities... ...
... interactive components, self-practice, different resource materials...
... learner-relevant examples, and relevant historic figure life stories.
Institutional Barrier to Use:

• Challenges related to “selling” the funding of an emerging (versus established) technology in tight budgetary times;

• No technical support owing to no substantive experience with the platform (an instructor-user needs to be the developer, user, and help desk);

• Almost exclusive use of hosted solutions (limits the “reach” of the funds obtained); and

• No institutional “network effect.”
Best Practice Remedies for Institutional Barriers to Use:

- [Low cost & exportable] OpenSimulator (either remote or self-hosted);
- D. I. Y. and joining user groups (instead of expecting technical support); and
- Contribute to the community and the “network effect.”
Student Barriers to Use

Even though students expressed a keen interest in virtual world use (and the voluntary participation rates are growing), the student barriers to use include:

• The complexity of the platform;

• Lack of time (or concern about schedule conflicts related to real time learning activities); and

• Lack of an advanced computer.
Best Practice Remedies for Student Barriers to Use:

- Offer both asynchronous and real time e-learning simulations and activities;

- Pre-create avatars for students;

- Layer simulations for maximum contribution to learning outcomes; and

- Survey students for feedback on simulations.
D.I.Y. in Virtual Worlds Handout

Handout for: "Interactivity, Engagement, and Increased Learning Outcomes in 3D Virtual Worlds" presentation by Kay McLennan

(Above) Urban City, Mountain Retreat, and Fantasy Sim OAR file freebies from Linda Kellie.

D. I. Y. in Virtual Worlds

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...Sample Resources...
>> Free resources from Linda Kellie @ www.lindakellie.com
>> Open VCE building resources @ http://openvce.net
>> Free resources from the Fleep Grid Shop @ http://fleegrid.com/store
>> OpenSim Creations @ http://opensim-creations.com
>> OpenSim Worlds @ http://opensimworlds.com
>> KarlJack Studio @ http://karljackstudio.com/

(Above) OpenVCE building resources.

A [cost effective] option...
...and even limited D. I. Y. can yield more user focused builds!

While the OpenSimulator (OG) and Second Life (SL™) virtual world platforms both include easy to use in-world building tools, it is the OpenSimulator platform (with no cost uploads) that best supports "do it yourself" (or D. I. Y.) virtual world simulation builds. Further, when using the OpenSimulator platform, the choice is between self-hosted or [economical] third-party hosted virtual world regions.

To self-host the OpenSimulator platform, the download page is at http://opensimulator.org/wiki/OpenSimulator. To locate remote hosting companies, see the Hypergrid Business e-magazine "Editor's Picks" for OpenSim Vendors at http://www.hypergridbusiness.com/opensim-hosting-providers/

Also, a useful "how to" publication (entitled, OpenSimulator. School Quick Start Guide) is available for download at http://www.carfel.com/docs/7020246/Opensimulator-School-Quick-Start-Guide.

Other "Getting Started" guides and resources are available at http://www.hypergridbusiness.com/category/resources/getting-started/ and http://www.hypergridbusiness.com/category/resources/
Questions?