SOMA HUD: A Virtual Application of an Advance Organizer

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Abstract: This paper examines an innovative and dynamic example of an Advance Organizer inside of the immersive virtual space of Second Life. The Advance Organizer is in use at a self-paced, dynamic, and somewhat open virtual learning environment where collaborative teaching and studio style learning are commonplace. The Advance Organizer is considered in light of prominent learning theories and an interview with the school founder and designer of the AO is discussed.

Introduction

The purpose of this paper is to present the reader with a well-grounded example of the active us of an innovative instructional strategy within Second Life, as well as to show some of the relationships between this example and prominent educational theories.

Second Life (SL) is a Multi User Virtual Environment (MUVE) that serves many functions for many different people, groups, and organizations, including acting as a safe place to test innovative new ideas where "failure has relatively few and inexpensive consequences (Wagner, C. & Ip, K.F., 2009)." Its potentials for use as a learning platform is of particular interest to a growing segment of the Real Life (RL) population as well. The New Media Consortium (NMC) consists of "nearly 300 members (up from 100 in 2006 (Atkinson, T. 2008)) including most of the top colleges and universities in the world, museums, research centers, foundations, and other forward thinking organizations (Linden Labs, 2009)," and there are other groups, outside of the NMC, which focus on education and learning as well.

With this level of focus on learning in a single virtual platform, it makes sense that Second Life also serves as a testing ground for new and innovative strategies in learning and instruction. The example presented in this paper is one such innovative instructional strategy.

SOMA- School of Design

SOMA School of Design (http://slurl.com/secondlife/Boudoir%20Isle/163/195/752) is a virtual school in Second Life, described by its creators, Katya Koolhas & Somatika Xiao (Avatar Names), as "a Second Life centered collaboration...for [invoking] a new era of flexible teaching technique & educational systems for Second Life (Linden Research, Inc., 2009)." SOMA School of Design primarily teaches learners how to use various picture editing software, such as GIMP and Photoshop, in a hypermedia environment using either a pay method (Linden Dollars), or a reputation point (RP) method where the learner earns credits and obtains progressive access to more difficult and previously unavailable classes.

SOMA, as a whole, functions in rhythm with the elements of Vygotsky's Social Development Theory (Vygotsky, n.d.). SOMA uses More Knowledgeable Others (MKO's), in this case Designer's Guild members, to guide other learners into success within their Zones of Proximal Development through collaborating on projects, mentoring, and aiding with problem solving. At the highest levels, Designer's Guild Members mentor less experienced learners in a form of Cognitive Apprenticeship. In this cognitive apprenticeship, the instructors use modeling, coaching, scaffolding, articulation, reflection, and encourage exploration, consistent with the methods outlined by Collins, Brown, and Holum (1991).

It would be interesting to see an official assessment of how SOMA School of Design meets the criteria laid out by Newmann and Wehlage (1900) for determining levels of Authentic Instruction. The assessment is meant for researchers to evaluate learning institutions and ranks them on higher-order thinking, depth of knowledge, connectedness to world beyond the classroom, substantive conversation, and social support for student achievement.

SOMA has created the classes so that they are problem centered, requiring higher-order thinking to succeed. The instructors often are the same people who create the classes, so the depth of knowledge is present. Additionally, the classes can be used anywhere in Second Life, leaving a likely high mark on connectedness to the world beyond the classroom (provided that we consider the world of Second Life to be "the world," as it occupies some point aside from real life).

Additionally, the conversation is often instigated by the learners and pertains to their own interests related to the classes. Social support for student achievement is present in projects and shows, as well as the displays provided around the school and made up of student work. Speculation based upon these examples lend to the idea that SOMA would very likely score well on this assessment, showing an example of an institution with a high level of Authentic Instruction in place.

Instructors frequently work to present inclusive lessons for students in one of two ways. The first is through group-learning classes where students gather in Second Life to work on (usually) separate authentic projects from one media viewer, asking questions as they encounter issues, while the second is through the innovative SOMA HUD, which serves an interesting role in the learning design and is the innovative instructional strategy example for this writing.

In the first method of group instruction, the elements are in place for following Gagne's Events of Instruction (Reiser, R.A. & Dempsey, J.V., 2007). The instructors first gain the attention of the class by calling it to order and ensuring that all learners have the class downloaded into their HUDs, and reviews any prerequisites for the current class (stimulate recall of prior learning). There is an example of what the class will be making staged next to the main viewscreen (as can be seen in Figure 1), and additionally a note with an outline of the steps involved in the process, which serve to inform the learners of the objectives. The instructor then presents the content to the group, and learners accessing the content provide the word "bunny" to cue the instructor to move to the next frame. As the course progresses, the instructor and other experienced members of the group help the less experienced learners along in their projects as questions arise, thus providing learning guidance. Simpler responses to questions occur in the main chat area, while more difficult requests for help go to a back channel private message (PM). The instructors elicit performance from the learners by asking questions, performing observations and inspections, and dialogue between the students and instructors. Instructors and experienced members of the design guild provide feedback throughout the learning, and additionally at a debriefing stage at the presentations' completion. This is a collaborative effort in team teaching. Assessment of performance comes in the learners' ability, or inability, to provide a finished product or produce the proper results at each stage. Assessment is frequent and progressive throughout the training session. SOMA often displays the learners' work publicly on campus, so the learners possess some motivation to create top-notch products. Finally, enhancing retention comes in through home practice and being able to re-access the class in a self-paced fashion at any time through the SOMA HUD

Figure 1: Main view screen with class topic example of a Trompe L'oiel.

A Quasi-Open School Model

The SOMA School of Design utilizes an open enrollment policy where anyone is welcome to join the school and these students are able to go through the entire course list without every paying money, however this non-pay method is only available via a reputation point system. The reputation point system is important because it creates a hierarchy that incentivizes the more experienced learners to take on the role of teacher in helping the lesser experienced learners. Reputation points are earned through spending time in the SOMA grid, helping other students, finding easter eggs and other reward systems around campus, and trying classes. Anyone is welcome to create and teach classes as well, which is another way to earn reputation points.

Additionally, SOMA includes open source software systems such as the GNU Image Manipulation Program (GIMP) in their listing of programs that they teach about and use. The instructors are active in promoting the use of GIMP photo editing software for use by all students and in second life and have a series of courses dedicated solely to this software. Additionally, the code base that built the virtual environment of Second Life has been made open source by Linden Labs. This enables other 3rd party viewers (the software package that interprets the code into a Graphical User Interface (GUI) for the user to navigate and interact with the world via their avatar), 3rd party Sims (environment builds such as townspaces), and even 3rd party grids (the "world" that the Sims rest upon) to be developed and utilized.

There are necessary stipulations that prevent total freedom in taking the classes as well such as a requirement to use the SOMA HUD for participation, or the fact that the SOMA School of Design is located within the Second Life Grid (which, while the code for Second Life is open source enabling other grids and viewers, the Linden Labs instance of Second Life is a closed system on Linden Lab servers, and thus, you cannot legally or easily transfer "property" in and out of the grid at will) as opposed to another open grid such as OpenSim. While not a completely open educational system, the SOMA School of Design certainly displays characteristics that seem both precursory to and inline with the idea of an open educational learning environment. SOMA emphasizes a collaborative learner support network, self-pacing, digital delivery, support of open source software, and a communal knowledge base.

SOMA HUD

The use of the SOMA HUD by individual learners falls under the Problem Based Learning Theory (McCaster University, 2010), where learners confront open ended, context specific, problems, in a self-directed fashion. Because they are design problems, they are among the most ill structured and thus require unique approaches and diverse skill sets (Jonassen, & Hung, 2008). The students encounter real problems and ask authentic questions through the help feature of the SOMA HUD when they need support. SOMA designed the HUD in a manner that meets the definitions of scaffolding (West, Farmer, & Wolff, 1991, p. 253). Most learners can realistically achieve the project goals, and if the students encounter any issues while working on the project, help is available. In addition, SOMA designed the HUD to encourage the learner to succeed, have help available, and to reflect direct instruction. One of the most interesting aspects, however, is the SOMA HUD's functioning as an Advance Organizer (AO).

The SOMA HUD meets all of the major requirements set by Ausubel for being an AO with the possible exception of being an abstract prose passage (West, et. al., 1991, p. 116). The HUD has several text elements to it, however it is primarily graphic in layout. An example of the main screen of the SOMA HUD is available in Figure 2. The SOMA HUD is deductive in nature, laying out a "big picture" by showing all of the currently available classes and then moving into specifics.

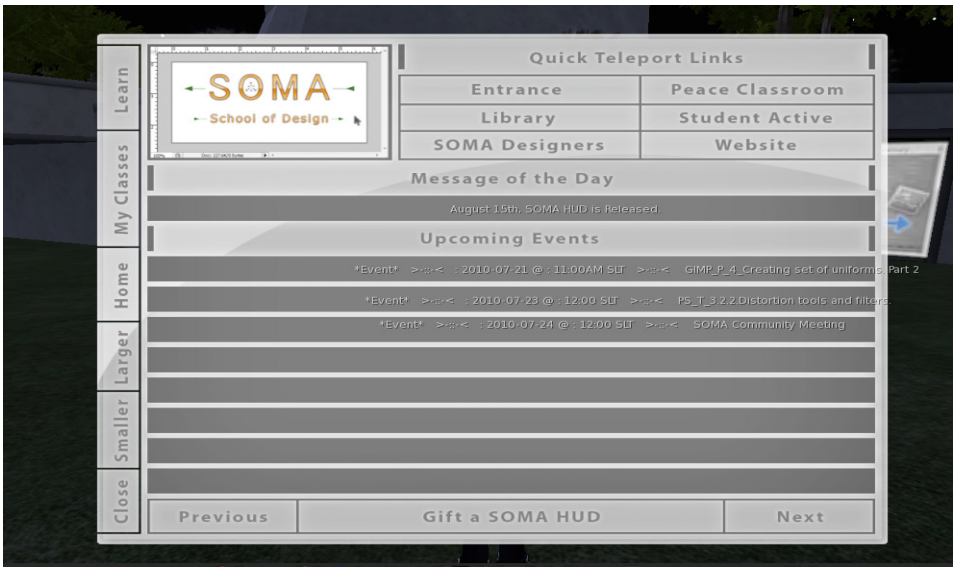

Figure 2: Main screen of the SOMA HUD

Expert learners are students who have a metacognitive strategy in place, and make it a point to be aware of, and follow, a process of planning, monitoring, and evaluating their successes in learning endeavors (Saemah, R., Zufia, M., Sift Fatimah Mohd, Y., Ruslin, A., & Khadijah Wan, I., 2010). It is interesting to consider the possibility of expert learners in relation to the SOMA HUD. A study into this specific learning environment would provide some insight regarding the distribution of expert learners at SOMA. If the learner has a metacognitive strategy in place, it is possible that when initially working with the SOMA HUD is where they would begin to form their learning goals.

The progression of class difficulty serves as a bridge that links new information to already known information, starting with how to download and install the program and moving into very specific texturing and 3-D like rendering of created graphics. The SOMA HUD also organizes and introduces new lessons, creates an abstract outline of the new information (by allowing the user to preview up to nine current classes at a time, as can be seen in Figure 3), and serves as a restatement of prior knowledge (inside of the lessons themselves). Additionally, the SOMA HUD provides a structure of the new information (classes are ranked, provide step-by-step instruction, and learners can choose from a group of classes to take next), and encourages learners to transfer what they have learned previously, as well as to apply what they know to their project.

If the learner has a metacognitive strategy in place, they would likely monitor their progress as they are going through the project. The SOMA HUD, as an AO, also shows how the classes rank, going from basic ideas (installing the program), up to very technical classes that are beyond common knowledge (such as creating a Trompe L'oiel, like in Figure 1).

When using the SOMA HUD, there are several presentation options available to the learner. The learner can change the size of the HUD to occupy more or less of the screen real estate for the convenience of the learner. Some of the classes have smaller details that can be difficult to see if the HUD is too small, so this is a nice feature. Additionally, there is an option to view the lesson "in-world." This is very convenient for the user in that it leaves the avatar free to perform other actions such as "rezzing" objects (creating them in-world from inventory) or experiencing the environment. The in-world viewer has great detail and even has slide presentation controls on the panel itself for direct access. If the learner wants to view their own private screen without the likelihood of distractions from or other characters (or other players' own media viewers or name clouds) blocking the view, the learner can simply zoom in on their own in-world media viewer.

SOMA Class Considerations

The students' progression through the classes enable a journey through Gagne's Outcomes of Learning (Gagne, 1984), specifically in the Attitudes, Motor Skills, and especially in the Cognitive Strategies aspects. As

students progress, they face a series of progressively more difficult problems that require the learner to grow, generalize, and change their various cognitive strategies in order to solve the problems they encounter. As the learner achieves these tasks, the attitudes of their own abilities improve, along with the learners' abilities themselves.

This process also corresponds with Bloom's Taxonomy in all three major areas of Cognitive, Affective, and Psychomotor (Bloom, n.d.). The learner likely operates under the entire taxonomy in pieces as they progress. The Cognitive Domain sub-categories of knowledge, comprehension, application, analysis, synthesis, and evaluation seem to applicable as an explanation of the requirements to progress through nearly any of the classes provided by SOMA. The Affective Domain sub-categories of receiving phenomena, responding to phenomena, valuing, organization, and internalizing values would likely do well at describing the likely attitudinal shifts that learners perform and experience as they progress through the classes as well. Finally, the Psychomotor Domain sub-categories of perception, set, guided response, mechanism, complex overt response, adaptation, and origination all seem to fit the development course that learners likely experience in their ability to create successful projects.

Authentic Assessment, as described by Wiggins (1990), comes into play when learners present the projects to the other learners in the school. Other learners and instructors can view, handle, and constructively critique the learner's result in a group or individual setting which serves as a form of debriefing. The learner gets immediate feedback both while creating the project and at its end through access to other learners' and instructors' perspectives and advice. This feedback allows the learner an opportunity to reflect upon their project and, if they have a metacognitive strategy in place, evaluate what they would do differently the next time.

It seems to fit that the learners update their current schemas of the content through subsumption of new information into old knowledge as they progress through the courses. Something interesting to look at would be to delve into how the real person is affected by subsumption of information that is actually happening to their avatar. The relationship between the real person and the avatar is interesting in itself. Rak (2009) states that "it is possible to think of virtual worlds as spaces where identity can be translated from the physical world to the virtual, resulting in a self which occupies a rhetorical third space, where virtual identities have real effects, and real identities operate virtually." Given this "rhetorical third space" self, it seems that there may be some interesting effects upon several processes involved in learning. While the avatar, described as the "externalization of desire," is often an idealized version of the self, able to do things without the same cost structures as real life, there are none-the-less real life rules that are still very applicable in Second Life (Rak, 2009).

An Interview With Somatika Xiao, SOMA Founder

An in-world interview with Somatika Xiao, founder of SOMA School of Design provided some interesting perspectives and information about the purpose and functioning of the school. A photo of Somatika (avatar) during the interview can be seen in Figure 3. When asked about the mission of SOMA School of Design, Somatika discussed creating a "highly flexible learning environment," using "multiple methods to teach, all using the same core class content," and focused on the goal of making learning possible for all learners at SOMA. Somatika also pointed out the benefits of the "self-paced system," mentioning that learners are able to take live classes if they need more help, but also that the classes are available at anytime, anyplace, thanks to their SOMA HUD. He also indicated the SOMA HUD as the most innovative aspect of learning at SOMA School of Design.

Figure 3: Somatika Xiao, Founder of SOMA School of Design and creator of the SOMA HUD.

The main benefits that Somatika reported of the SOMA HUD is its accessibility not only to taking classes anywhere, anytime, but also that the single HUD holds all of the classes that the learner has access to, not just a single class like many other HUDs. This feature helps with management and organization of classes. Somatika explains that the initial development time was around six months from inception to implementation, however the SOMA HUD has seen constant update and revision since its' inception.

When asked about the flexibility of the HUD for taking other types of classes, Somatika reported that some of the other students are already using the new Beta (version 1.36) and the Developer Kit Beta to create classes that are "180 of the classes we teach here." Somatika then explained that, in addition to slideshows, the new version of the SOMA HUD allows for in-world, in-HUD display of websites, thus allowing video to find its way into the classes. "It could also work great for catalogs," Somatika says, referring to PDF styled 3-D simulations. Another aspect of innovation reported by Somatika is the "potential for shared learning," in that learners are able to go in-world with friends. When taking the same classes in-world, the opportunity for helping each other through trouble spots, lending encouragement, praise or advice, and sharing the learning experience grows.

Somatika is the only developer working on the SOMA HUD. When it was mentioned that he may get some help in the future, he replied: "That would be nice, although I quite like getting hands on with my 'Baby;' allows me to push my skills." With a hands-on attitude like that it is not surprising that SOMA has seen the growth that it has.

Conclusion

While the SOMA HUD serves as an effective example of an innovative instructional strategy, it must be noted that the SOMA HUD is only one small example in a virtual sea of possible examples. Aside from the HUD, there are many examples, from the military using Second Life as a testing ground for hostage situation simulated strategy training to NASA creating a lunar landing module, that could have been explored.

While every effort was made to consider the scope of the available instructional strategies and their relationship to the innovative use of the SOMA HUD, it is very difficult to consider all aspects that may relate to these examples. Within this one example of the SOMA HUD, there is such a depth and breadth of various strategies and theories that affect the design, use, and functioning of the HUD, especially in relation to its' users, that a complete encapsulation of the related theories, strategies, and their functions is likely infeasible.

With this under consideration, it is the author's hope that a sufficiently well-grounded example of an innovative instructional strategy in active use within Second Life has been provided in this writing, and that educational theories have been properly treated and tied into the example of the SOMA HUD.

Innovation is often thought of as bringing something new to the table, but it can also follow the entrepreneur's path of creative destruction. This process involves tearing down everyday things into the elemental

parts and then recreating them to become better, more functional, and meet new uses and needs. The SOMA HUD is just such an example of this type of ingenuity in design.

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