Into the Twilight Zone: Innovations for Education, Virtual Worlds and Emerging Media

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Abstract: Constructivist learning activities offer excellent opportunities for students to dream and create the future. In a creativity exercise, an emerging media class used online collaborative tools to share their visions of the future, and explored what it would take to realize their dreams. The featured topics span augmented reality, innovations in Web technology, game-based educational simulations, artificial intelligence in knowledge management, research in holographic displays, and the requirements for a Virtual World Education Grid.

Introduction

An eerie quiet followed the pronouncement that the class would complete a group project and an individual project in the Fall 2010 offering of the EM 830 course, Virtual Economics and Business. Students dread working on group projects, and the challenges that were noted in a previous paper on facilitating team interaction in the online classroom (Calongne, 2002), remain true today. While the communication tools are better, a busy life replete with work, family and online class requirements makes it difficult for adult learners to enjoy cooperative work, especially when it centers on planning for prospective innovations and envisioning how best to accomplish them.

The future lies in the shadowy realm of the Twilight Zone. While listening to Donald Pleasance portray Professor Ellis Fowler in the Twilight Zone episode The Changing of the Guard (Serling, 1962), it was clear that our role as educators is to transform the lives of our students. Pleasance's moving recitation of A.E. Housman's "When I was One and Twenty" (Housman, 1896) and the episode's tribute to the life of an educator remind us that the role of education is to prepare students to face and fashion a brave new future.
One of the challenges for online education is to provide compelling learning experiences that synthesize the concepts to promote contextual skill development and critical thinking skills. Rather than limit our investigation to problem-solving approaches to the issues in virtual economics theory, the students used a constructivist learning approach to create collaborative and individual business plans that explored their visions of the future.

Surprisingly, the hardest task from the educator's perspective was sharing several Google documents with everyone in a large, doctoral class while giving them time to form into groups and select project topics. The process as they developed their innovation ideas and transformed them into business plans was conducted during a series of weekly online class meetings held in Second Life and via application sharing in Adobe Connect.

A startling announcement by Linden Lab (Harrison, 2010), coupled with the research interests of Colorado Technical University's emerging media students, stimulated their innovation ideas. The excerpts featured in this paper span the following topics:

- Artificial intelligence in knowledge management systems
- Augmented social reality gaming
- Research in holographic weather analysis
- Game-based educational simulations
- Innovations in Web browser technology
- VoiceText for hands-free text messaging
- Virtualized musical instruments
- Virtual world education grid
- Social marketing for educators
- Virtual language world

While the following innovations are not possible today, these are the hot topics for shaping the future of technology for education, entertainment and business use.

**Edward Lavieri on a Synthetic Knowledge Management System (SKMS)**

Knowledge Management Systems (KMS) provide a means to create, manage, store, and retrieve information. These systems support strategic planning and decision making activities. The Synthetic Knowledge Management System (SKMS) will add an artificial intelligent (AI) interface to an enhanced KMS. The AI element represents the “Synthetic” portion of the SKMS name.
It will be modeled after the LCARS computer featured in the Star Trek: The Next Generation television series (Roddenberry, 1987). The very nature of the LCARS (Library Computer Access and Retrieval System) was designed to provide an audible interface to the starship’s repository of information and status of various systems.

The enterprise SKMS will provide educators, management and executive leadership with an audible interface to their various information systems and databases, operating on standard PC and Mac computers connected to organizational networks and the Internet. The benefit of this system is that operators can interface with their KMS using natural language. Instead of complex database queries and analysis, the SKMS can be asked, “Which of our stores are underperforming in our consumables market?”
Executives will no longer need to learn how to use complex information systems or knowledge management systems. With SKMS, they can simply use conversational language to access, learn, and more. There is no system like this in existence today, not in industry, research labs, or in the government.

Len Bisson on Augmented Social Reality Gaming

ASR Applications will be the leading provider of Augmented Social Reality gaming applications for smart phones. The cornerstone of our offerings will be the ASR Assassin application. Using augmented reality interfaces, ASR Applications will put the social back into social media.

The social media market is inundated with websites that provide the opportunity to socially connect with individuals around the world. These sites, such as Facebook, have millions of users looking to make connections. The number of social connections associated with an entity (people, businesses or organizations) is a sort of online status symbol. What's interesting is the terminology used on these websites, such as *friend* ing someone on Facebook. In many instances the people that are your *friends* may not in fact fall in line with the traditional definition of a friend. The social connections made online are potentially real-world friends, but in many instances may not even be real-world acquaintances. If a user were to meet one of their connections at a party they may or may not even recognize the person as someone they are *friends* with. In some cases this fact is blurred even further. On sites such as Second Life, or World of Warcraft, the real identities of people may not be readily available since they are represented by avatars.
ASR Applications plans to span the social media and the real-world by linking the two together through our smart phone applications. This will allow people who have a difficult time remembering names and associations (myself included) to have a solution in their pocket. This application will identify the person they are looking at and provide background information. It is the solution to the often asked question "where do I know them from?" The goal of ASR Applications is to bring people together, online and in the real world.

With this base platform as the starting point, ASR Applications will bring people together through games. The popularity of games on Facebook, such as Farmville and Frontierville, is readily apparent. Interacting with friends to play games allows people to have fun and stay in touch. What is lacking is the actual social interface. ASR Applications plans to change the expectations of online games and actually encourage real-world interaction. ASR Assassin will be a team based game, much like laser tag. The main idea is to work together with your team to track down your opposition and tag them with the application, which will require direct line of sight to the target. Getting people outside and actively pursuing each other in an online game vs. sitting at a desk.

ASR Applications will create smart phone applications that are able to interface with a multitude of social media platforms. The first phase of ASR will be to create an interface with Facebook that allows people to view their connections through the video finder of their smart phone. By looking through the video, the application will overlay the Facebook account name and associate it with a person in the video feed. For the first phase of this project, the application will require the person you are looking at to have the application installed on their phone and they will need to choose the option to be discoverable. In other words, the person you are looking at needs to agree to have their Facebook feed discoverable by their friends. This is the first step towards realization of the ASR gaming community. By using existing contacts, the ASR gaming environment will be seeded with contacts ready to have fun. This base functionality and interface, while not directly related to game play at this point, will be a cornerstone to our gaming applications.

**Erven McGinnes on a Holographic Weather Analysis and Prediction System**

The use of weather charts in a modern sense began in the middle portion of the 19th century when weather map pioneers William Redfield, William Reid, Elias Loomis, and Sir Francis Galton, created the first weather maps in order to devise a theory on storm systems. The development of a telegraph network by 1845 made it possible to gather weather information from multiple distant locations quickly enough to preserve its value for real-time applications.

The Smithsonian Institution developed its network of observers over much of the central and eastern United States between the 1840s and 1860s once Joseph Henry took the helm. The U.S. Army Signal Corps inherited this network between 1870 and 1874 by an act of Congress, and expanded it to the west coast soon afterwards.
The use of weather analysis and forecasting played a major role during WWII for the D-Day invasion. The advancement in weather analysis at that time showed the criticality that weather analysis plays in differing situations, not only during a war, but with everyday life.

The introduction of computer systems has brought weather analysis and prediction into the 20th century, expanding the forecast accuracy window from seven days to 14 days, but all of this is being done on flat screen monitors. Weather analysis and prediction has to be brought into the 21st century with holographic displays that will allow the meteorologist to see firsthand at what a current weather system or pattern is doing and what could happen if changes to the atmosphere or landscape occur.

In 2010, 3D projections of current weather conditions are displayed on flat screen systems. The proposed innovation takes it a step further and uses a holographic projection on a global model that forecasters could actually walk around and see what is happening.

Recent advances in both the fields of meteorology and geographic information systems have made it possible to devise finely tailored products that take us from the traditional weather map into an entirely new realm. Weather information can quickly be matched to relevant geographical detail. For instance, icing conditions can be mapped onto the road network. This will likely continue to lead to changes in the way surface analyses are created and displayed over the next several years.

Quiana Bradshaw on Game-Based Simulation Technology for Educational Use

Game-based simulations are used in a variety of fields, including education and corporate America. 3D simulation technology is emerging across a variety of platforms and is very complex, eclectic and advanced, permitting users to expand their roles and test their perceptions in immersive virtual simulations.

This innovation proposes the capability to rapidly create and use game simulations for roleplaying, digital storytelling, engaging games and learning. Students, as well as educators, will use an integrated set of collaborative tools to generate a simulation and relate it to their class activities.

Role playing and characterization are common in game-based simulations, which portray the users as avatars. An example is noted in the popular Electronic Arts game The Sims, and in the 3D educational storytelling and game design tools, like Alice from Carnegie Mellon's Alice research group.

While Alice's goal is to help students learn computer programming through a 3D graphical environment, our game-based simulation technology takes simulation design to a new level, serving a wide variety of course concepts, rubrics and assessment outcomes. Game simulation technology in education will diversify the learning experience and offer immersive instruction that strengthens learning retention and critical thinking skills. In the education sector, there are many ways that the game can be implemented to help
students learn by playing. The sense of presence within a simulated environment offers opportunities for greater interaction and immersion between players and the learning objects. The advantage of game-based simulations includes support for a wide variety of platforms and mobile devices, making education engaging for tomorrow's students. The technology is not limited to educational use, and offers extensive benefits for corporate training and team building.

Mark Shaffer on Threading in the Web Browser XDP Project

Currently web browsers serve as a single-threaded, stateless environment for client side development. Developers, when implementing tasks within a web browser, have JavaScript as the client side development language. Developers will quickly realize the weakness of client side browser development when they attempt to implement logic that takes a long time to implement. The result is an annoying message from the web browser, as shown in Figure 3.

![Unresponsive Script Dialog](image)

**Figure 3.** Unresponsive Script Dialog

If you implement tasks within a browser that take a long time to process, you block the single thread of the browser. This is a problem. While there is the ability to chunk up the work within a single thread using the setInterval() function, it is very ugly to implement. The Web Browser XDP (a working title for the project) is working on a better solution.

The Web Browser XDP project recommends for Web browser developers and the ECMAScript governing body the use of a simple threading function. This function permits the implementation of complex tasks in the background without affecting the Web browser's thread. Instead of using a complex threading package with parallel processing and synchronization logic, it features a simple function that will support a 10-million loop process efficiently.
Shane Archiquette on VoiceTEXT for Safe Text Messaging on the Go

VoiceTEXT will be the premier safe text messaging platform of the future and provide educators who are driving the ability to safely use a short messaging service while in motion in a vehicle. It will feature automated, voice-driven commands for message sending and receiving.

Commuting times consume a significant portion of the work day, making them an ideal time for communicating while stuck in traffic. The current need for a viable solution to deter drivers from using their hands during text messaging is needed and is currently a worldwide problem for driver safety. There have been other attempts to make a safety critical grade of voice to text messaging but all do not have robust and dependable voice recognition and transmission capabilities.

The solution will be designed to encompass all major aspects of text messaging entirely through voice commands with no physical interaction on the phone. The user would set the voice enabled mode prior to driving, then during the rest of the trip, the driver will be able to issue communications via short message service with input purely from voice.

The problem with current voice technologies are intermittent reliability that requires the user to visually verify whether the text is accurate and will be sent properly. VoiceText will allow the option for the user to play back the message prior to sending to verify as well as edit the message accordingly. These are the key differentiators from the VoiceTEXT solution and the software will be developed for all major mobile phone platforms including Android, iPhone OS, and Windows Mobile 7.

Josue Martinez on the Uplay User Adaptable Musical Instrument

Imagine an instrument that is fully configurable, programmable, light-weight, low energy and fully portable. Boriken Micro, a proposed innovation company, is proud to introduce Uplay, the user adaptable, versatile musical instrument. The Uplay will be a remarkable product that will revolutionize the music industry by allowing the users to design, adapt, configure and play musical instruments electronically to match their needs. Each person is unique with regard to their motor and learning skills, and the Uplay will allow users to arrange, design and configure the software and hardware to suit their needs.

Conceptually, the Uplay communicates supporting both wireless and wired technologies. The Uplay does not rely on strings, but instead uses a touch display that can be configured to create hybrid instruments, and rearranging the instrument's features as the user wishes. The Uplay will come with dozens of predefined instrument templates and examples of how to arrange the multiple snap-on touch display modules for different shapes. The low power touch display modules empowers the user creativity by allowing them to create their own visual display content that could embody anything within their imagination. Examples of visual display content are visual skins that could be made out of bitmaps, photos, videos, web pages, instrument skins, or whatever the user wants to
display. The touch screen areas are user defined, and can be easily adapted using modifiable templates that accessible over the Internet.

The Uplay takes advantage of the built-in touch screen and wireless capabilities of today’s most successful smart phones, portable media players and tablets. The Uplay will come initially as a software product, which will target the Apple line of mobile devices, such as the iPhone and the iPad. In addition, the software product will support mobile devices with the Google Android operating system.

Currently, an individual who wants to play an instrument has to physically adapt to it. The user has to maintain a certain posture and handle the instrument in a rigorous, specific manner. Due to the mechanics intrinsic to an instrument, there is also an associated learning curve. The Uplay could effectively minimize some of that learning curve by allowing the user to create an electronic representation of the instrument, and on the touch display, to tailor it to their unique motor skills. For example, acoustic guitars come in different sizes, yet could be made custom-fit to satisfy the dimensions of a child or the variations noted between adult-sized bodies.

The mechanics associated to play the instrument will not be constrained by the physical properties of the instrument. The Uplay allows you create a virtual guitar that behaves as if you were playing a piano or via another instrument's mechanics. These behaviors are limited by the user's creativity. The users will define their own instruments by adapting the “EasyPlay” templates to create unique instruments, sounds and behaviors. Rather than be limited to playing traditional instruments, users will create virtual instruments and define new ways to play them using an Apple mobile or Android technologies,

**Cynthia Calongne, Paul Tomaso and EM 830 on the Virtual World Education Grid**

The Virtual World Education Grid (VWEG) is a window into the future of learning. The explosion in the use of social media, the technological advances in graphics, and the communications power of the Internet brings the world to the fingertips of anyone ready to venture into the vast sea of information.

The 21st Century is a world vastly different from the preceding century. In order to remain competitive, educational institutions need to deliver content in a format that leverages the technology that students use. The next generation of students, and even some of the current generation, are becoming more involved in online communities, as noted by the explosion in social networks, such as Facebook, Twitter, and Ning. Virtual worlds, such as Linden Lab's Second Life® and, even more prevalent, the massively multiplayer online gaming industry, are filling an important role in the Internet culture.
On October 4, 2010, Linden Lab announced that educational, non-profit and other organizations that were receiving half-price rates for their servers would no longer receive these reductions as of January 2011 (Harrison, 2010) and the fees would increase from approximately $150.00 to $295.00 per server per month. As most universities, schools, museums and non-profits plan their budgets 1-2 years in advance, the price increase threw the community into a panic.

In response to their feedback, Linden Lab offered a continuance of the current rate under a prepaid invoice for 6, 12 or 24 months. While an attractive rate, the community began to search for a grid that offers a stable, yet affordable virtual world solution.

Virtual world grids are a connected series of servers, also known as regions, that allow users, called avatars, to move between servers, to interact with other users and to enjoy 3D content. The intersection of people and information in these immersive spaces offers support for kinesthetic and visual learning styles. Applied and activity-based learning leverages classroom simulations, and content development is available for everyone, including students.

As a group activity, the emerging media class, EM 830, studied the problem and began work on a business plan for the future virtual education grid.

The recent exodus to open source and proprietary, closed network educational solutions has not addressed the need for a single, Virtual World Education Grid within which educators worldwide may create their own virtual worlds, visit other educational sites, collaborate, share content, attend conferences and conduct classes.
For the academic community, the VWEG will provide an integrated, extensible grid for public and private educational activities, featuring:

- Simulation technology
- Game design
- Interactive 3D graphics
- Voice over IP (VoIP) communication
- Text chat
- Streaming audio and video
- Collaborative online course environments

The grid design provides the structure and tools for developing collaborative, 3D courseware for use in the online classroom. The VWEG offers the capability to design rich digital environments and immersive 3D simulations for student exploration. Instructional designers and 3D content creators, as well as educators and students, find it a visually rich environment for collaboration and conceptual behavior. Institutions, teachers, and students will use the VWEG to collaborate and share their skills and experiences, fostering innovation and creativity.

The challenge is to design a grid that supports the needs of tomorrow's virtual world for:

- Private and public use
- Student and faculty access
- Voice and text communication
- Import and export of images, animations, sounds and objects
- Fast content development
- Digital rights with persistent meta tags
- Integration with learning management systems

**Paul Derby on Social Marketing Virtual World Educational Resources**

Awareness of the vast number of virtual world resources that are available to educators is needed. Social marketing these virtual world educational resources strengthens the effective use of the Virtual World Educational Grid (VWEG), extending it from a network of servers to focus on how it will offer free and low cost resources and services to support education.

A unique virtual world educational resource area will be designed to support access to existing learning simulations, the rapid development of new 3D simulations, and integrate VOIP and rich graphics within a virtual world that is designed by educators and for educators to enhance student learning.

One of the challenges that educators face is the steep learning curve and need for effective virtual world course content. A strong promotional campaign to create an awareness of the virtual education capabilities is directed towards the educational market, K-12 and higher education. This awareness campaign will target educators through educational publications and journals, including American Educator, Current Issues in
The VWEG serves as a network for virtual worlds, and this social marketing innovation showcases a content management system for storing information on content creation, skill building resources, 3D learning objects, publications, learning simulations, virtual conference proceedings, social networks and information on educational and professional development opportunities for students and educators.

The Virtual World Education Grid will benefit from the development of a global community that embraces educational, business, research, entertainment and game communities. The promotion of these social educational communities will be central for a successful leaning community in virtual worlds.

**Ricky Keeling on a Virtual Language World**

Online learning and virtual education continues to grow at astonishing rates in all levels of education from grade school to universities. One forgotten special needs group of students is being shut out of the online learning experience; second language learning students. In an online environment, almost all discourse and interaction is written. This provides special challenges for English second language learners. Research in virtual world language immersion to date is limited. The Virtual Language World encompasses virtual world immersion tools for language instruction through scripted three-dimensional objects to provide Second language learners a tool for practicing the English language in hopes of becoming proficient at an earlier time than the norm.

The Virtual Language World (VLW) is a small, Arizona-based Virtual Language Learning organization that will utilize the World Wide Web to provide a vehicle for learning different languages in a virtual world setting. The VLW will utilize the freemium economic model, offering the language learning world membership for free and offer a paid membership with more functionality. This economic model will seek aggressive growth in order to quickly squeeze out any and all competition in the Virtual Language Learning Market. The Virtual Learning World will offer language interaction in over 100 different languages through text chat and VOIP network communications. The VLW will also support member creation of content in all virtual world spaces to create a sense of presence, immersive culture, encourage participation, and give a feeling of ownership not currently allowed in all virtual world settings.

The VLW will allow uploading of content however, the VLW will remain a PG-13 rated virtual world community with no adult content allowed. The VLW seeks to offer unprecedented customer attention by providing free customer service via text chat 24 hours a day. The Virtual Language World will become the premier destination for entry level and expert computer user virtual language education destination.
The Virtual Language World will be participating in an exciting, and developing virtual world education market. Use of the Internet for Web-based learning modalities has skyrocketed in the last decade. The market is worth $1.5 billion annually. The Internet World Stats site for usage and population statistics recently published the current number of 1,966,514,816 Internet users in February, 2011 (Internet, 2011).

Conclusion

As we reflect on the technologies and innovations that intrigue students, a common theme emerges. The face of education is changing, partly due to: technological advances, like the iPhone and Droid cell phones; free Web 2.0 tools that promote online collaboration; PCs with enhanced 3d graphics; cloud computing; and mobile computing solutions. The cultural influences are equally compelling, offering students global access to information, social networks and a media rich society that is moving beyond the passive consumption of media into the production of audio and video podcasts for educational use.

Emerging media embraces Web engineering, social media and social networks to characterize the future of communication and software design across the Internet. As Kevin Kelly noted, we are the Web (Kelly, 2007), and our connection to the Web and everything that we do contributes to the future of education.

The Holographic Weather Technology is but one domain for holographic simulation, leading to future research in augmented reality and educational contexts that blend virtual data in a real world setting.

As John M. Richardson noted (Richardson, n.d.) "When it comes to the future, there are three kinds of people: those who let it happen, those who make it happen, and those who wonder what happened."

References


