

Dedicated Social Media Infrastructure

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Abstract: A proposal designed to address the continuing crisis in American Education is outlined. The proposal would field a virtual world based social media designed as a type of boarding school. The media will serve as a means for any high school student to prepare for college level study.

Introduction: An extension of current social media is proposed as the virtual part of a dedicated infrastructure. This virtual part is to be connected to communities via state chartered corporations owning a franchised specialty shop serving coffee, healthful teas, and baked goods. These shops will have teleconferencing facilities. Economic support for a virtual transition programs supporting high school to college transitions will come from these specialty shops. Our virtual infrastructure will also be connected to colleges and universities as part of college recruitment services. Initial funding to create a next generation virtual world system might be developed as a grass roots movement, or as a grant or loan from the federal government. Initial costs are estimated at one hundred million dollars, a small sum in both government and corporation worlds.

The problem that the *Bridge* addresses is stated in one short sentence. High schools are failing to graduate students prepared for college level study. Thus the common access point for any sixteen, seventeen, or eighteen year old; will be the Internet not the high school classroom. The individual will enroll through an identification process, where all private information is protected in secure fashion. Once enrolled, fees will be minimal or easily waved so that in no case an individual is prohibited from enrollment due solely to financial consideration. The profits from Second School™ specialty shops will provide enrollment slots. The growth of the system will depend on funded slots. Enrollment will; however, be conditioned by strict terms of agreement. Similar to the model of a boarding school, it is understood that participation in the *Education Bridge* is subject to continuing demonstration of advancement and in the individual's conformance to behavioral rules.

The On-line Reality: The transition infrastructure is to include a platform for three dimensional on-line game type environments, with avatars, buildings and landscapes. Individuals will develop building skills and learn how to simulate real world processes using natural science and higher mathematics. User accessible building and process scripting is currently available in Open Sim¹ and Second Life™ virtual world infrastructures. Individuals may learn to shape terrain, place vegetation and scripted animals, and build building structures. In this way the owners of these systems benefit from user effort. The *Education Bridge* virtual worlds will provide building and scripting tools, available now as free open source software from Open Sim.

In most cases; however, these building and scripting tools will be used to teach architectural principles, or principles from the sciences. Some elements of higher mathematics will be linked to things like the stress on building beams, or the natures of population grow in an aquatic pond. The center of the *Bridge* virtual worlds is the virtual classroom. Virtual classrooms will have desks to sit at and writing tablets. The role of handwritten messages resolves a number of challenges, as will be discussed.

Public-private Partnerships: We expect that a *National Education Bridge* will be administered by public-private partnerships at the state level. Its presence will radically alter the freshman mathematics class, first by better preparing entering freshman in higher mathematics and science. The technology within the *Bridge* will also accelerate a common understanding of advanced technologies. For example, a new technology based on stratification will be explained, introduced and implemented^{2 3}. The platform will not be “for on-line gaming” but rather will be as a means to establish virtual communication and support for learning and teaching. The same system will evolve a design medium focused on supporting sustainable economic processes.

These goals are not unreasonable. Several parties are developing various types of next generation collaborative cooperative social media. On-line game systems, and social

¹ Open Simulator web site: http://opensimulator.org/wiki/Main_Page

² Prueitt, Paul S. (1995) A Theory of Process Compartments in Biological and Ecological Systems. In the Proceedings of IEEE Workshop on Architectures for Semiotic Modeling and Situation Analysis in Large Complex Systems; August 27-29, Monterey, Ca, USA; Organizers: J. Albus, A. Meystel, D. Pospelov, T. Reader

³ Prueitt, Paul S. (1995) An Implementing Methodology for Computational Intelligence. In the Proceedings of First International Conference on Computational Intelligence and Neuroscience. IEEE

media like Second Life™ are well developed. Open source versions exist. As these new platforms are developed we find congruence between the design advanced in the marketplace and the concepts we have described as part of our initial work on the *Bridge*⁴.

New Capabilities: There will be innovations; primarily arising from methods developed for national intelligence⁵. The architecture for the *Bridge* platform is based on a stratification of virtual phenomenon, reflecting organizational stratification found in nature. It will have features and capacities not found in the current generation of virtual worlds like Second Life™. For example, in Second Life™ and Open Sim virtual platforms, one finds a well-developed physics simulation engine, but nothing that would serve as a biology simulation engine. The new system will move us in this direction.

Stratification allows the use of process ontology, and other models of complex phenomenon, to guide the development of complex simulations by ordinary users. How this works is outlined in our proposals⁶. While this feature is now only a theoretical notion, the new architecture can be shown to have capacities not realizable without stratification. The ability to produce a model over all activities within a virtual world is one of these capabilities⁷.

Current simulation worlds have many important existing capacities. Only a few minor issues exist; namely the tools needed for monitoring activities within a closed system, and a new set of tools that support digital exchanges of handwritten notes. Handwritten note taking is an essential skill, one that is largely absent in underserved college classrooms. Deep learning, as defined in our work, involves a shift in responsibility for learning from the professor to the student.

One means to enhance deep learning is for the student to take notes in class, and review their notes while outside of class. Each semester, an upper list of names of topics would

⁴ Prueitt, Paul Stephen (2011) Systems Science and Service Computing, <http://www.servicetechmag.com/I57/1211-3> Published Dec 14th 2011, Service Technology Magazine.

⁵ Prueitt, P. (1997). Grounding Applied Semiotics in Neuropsychology and Open Logic, in IEEE Systems Man and Cybernetics Oct. 1997.

⁶ The American Education Bridge, a proposal to President Obama; draft materials have been posted at www.educationWorlds.com.

⁷ Prueitt, Paul S. (1996). Semiotic Design for Document Understanding, in the proceedings of the Workshop on Control Mechanisms for Complex Systems: Issues of Measurement and Semiotic Analysis: 8-12 Dec. 1996.

be included in the course syllabus. The upper list will be extended using two-level topic taxonomy. Each semester, the course would start with no topics in the focus topic repository. Students will meet to review video and to work on video clip submission to the professor. Students might prize note taking, even though all posting to the community of practice will always be missing name and voice. Topics would develop both in number and as additional notes on a specific topic is submitted.

In the virtual world a student will be able to write on a tablet, or sheet of paper with a digital pen. Peer-to-peer interactions is being proto-typed from the website www.liftingPedagogy.com. This site will develop a topic map model of student perception about deep learning methods⁸. When our real time digital handwriting exchanges is on line, we will further develop a focus topic orientation to deep learning by allowing students to post sections of individual class notes as part of class activity.

Complete Monitoring using Intelligence Methods: The monitoring issue takes a bit to understand. Remember, our education worlds are to be dedicated to an instructional process. It is necessary that the interaction between the individual and the system be experienced as a teaching-learning experience. There are many ways in which this can be accomplished. For example, individual professors may work with individual students using normal communication skills realized in digital handwritten message exchanges, text exchanges, voice and even video. One of the learning outcomes is related to classroom note taking skills. However, if certain systems are used it is possible to retain sufficient information about the individual so as to “understand” how learning objectives might be achieved. These types of systems were designed or worked on by those who have influenced the development of the *Bridge* proposals.

So what about this idea of complete monitoring? The first issue is regarding technical capability. Again, this issue requires some extended background and will be discussed in the proposals. The second issue is regarding constitutional rights. Peer-to-peer communication is to be monitored so as to keep the in-world interactions focused on agreed upon learning objectives. Whereas this concept of “the system monitoring all

⁸ The capabilities of liftingPedagogy.com will be developed, as funds are made available.

individual activity in the system” is fraught with concerns; we may represent participation in the system as similar in nature to enrollment in a boarding school.

Three types of participants are found; students, professors, and administrators. Students tacitly agree that the boarding school will know about anything that happens within the student community; and the student community will work hard to violate this agreement. This is the nature of being a young individual. Clear communication of agreements might include provision for expelling/suspending an individual or for rewarding certain individuals for positive behavior. Clearly how the rules will evolve will be determined as we go along.

Building and Learning in Simulation Worlds: The capacity to build in a virtual world gives, to the individual, one profound reason for more complete participation in educational processes. In current mathematics education we find the motivation level is all too often purely antagonistic. The reasons for the antagonism are discussed in the chapters of the *Bridge* proposal. In brief, we believe that the majority of individuals have felt cheated by experience in “math” class. This feeling has, over the young life of the high school student, resulted in deep changes in the mechanisms involved in the perception of self. The conjecture about an acquired learning disability was first developed in 1984, and proposed as a PhD thesis in the College of Education at the University of North Texas, by Prueitt. This conjecture was not regarded with favor by the tenured graduate faculty in the College of Education. In 1988, Prueitt earned a PhD in Pure and Applied Mathematics from the University of Texas at Arlington⁹. This work was a second step in developing a thesis that most individuals graduating from high school have repressed interest in higher mathematics.

Later we will say more about deep learning, simulations and building in simulation worlds. For now we simply mention that the simulation world provides an rich and potentially exciting place to learn; not by playing games but by actually designing and building machines and simulations of complex social, biological, environmental or economic processes. A rich social interaction is also possible. To support the proper use

⁹ Prueitt, Paul Stephen (1988) Some techniques in mathematical modeling of complex biological systems exhibiting learning, PHD Thesis, in Pure and Applied Mathematics, University of Texas at Arlington Press

of the simulation world it is necessary to create the sense that one should separate personal experience and public experience consistent with normal social conventions. Monitoring is both necessary and positive, when the Constitutional rights of individuals are respected. Learning must be measured, both by the individual and by the system. Absolute assurance of informational privacy is required. These challenges are difficult ones, unless there are tools and technologies integrated into the infrastructure's processing kernel. How this is to be done is addressed in our technical papers.

The Acquired Learning Disability: The repression is enfolded into a complex behavioral syndrome. An accommodation has been made that sees higher mathematics as both undesirable and unattainable. The thesis regarding repressed ability is connected with new social phenomenon. We expect radical change. The provision of a virtual world building capacity could excite the individual and provide an avenue towards establishing new individual goals. Whereas this will not be ideal for everyone, we may see a significant change in how well higher mathematics is understood. In at least some cases, individual goals would arise from the opportunity to do something "real. Our learning pedagogy deepens the experience and in some cases overcomes completely the acquired antagonism. Deep learning enhances the opportunity to take learning experiences and apply them in ways that benefit the individual and society.

A new reason for learning higher mathematics is given to the young person. This reason recognizes the individual. In our planned three-dimensional social media, it is possible that the inner sense of self will find fertile ground in which to grow. Let us examine why this would be so. Deep learning in the college classroom creates a reliance on the self. The methods of deep learning, for example the loop exercise we will discuss shortly; create individually controlled learning cycles, without the need for a third party "teaching". The responsibility for learning is shifted, at least partially, from the system to the individual. As this process develops, we may see a partial substitution of the individual professor for the three-dimensional simulation world.

Educational experience should reveal an inner sense of self, even while there is a context for personal growth, and economic rewards, provided by the "system". In many good colleges, focus topics guide this process. Three-dimensional social media enriches what

might be possible. For example, building in a virtual world leads also to experimentation and innovation directed at the central economic and environmental challenges we face. As part of the areas of application, the technical details of green energy innovations become accessible early on. The new capabilities, based on building and simulation experiences, create a new horizon. There are economic motivations, as well as an unfolding of the inner interests along a guided path.

Renewing the American Dream: Technical discussions require some background expertise, which we take up later on. What about the results we wish to achieve? Our desire is that the American education system recovers lost ground, given up over the past five decades. We also wish to see a cultural and spiritual renewal, one that is based on multi-culturalism. We anticipate a renewal of humanistic principles within an advanced democratic society. Our desire is that the system in the United States of America fulfills the American Dream for everyone, not merely a privileged few.

The *Bridge* is designed to be consistent with the world that our children will live in. Education is the key to re-opening the American Dream to each citizen. The current system limits access to higher education, as well as opens access to a few. This outcome might be changed in several ways, one of which could be the *Education Bridge*. We all must become more fully and broadly educated. As a nation we must all become more fully educated.

An economic theory is used to fully discuss free market capitalism. Market economics will be one focus of the educational content to be delivered via the platform. Again stratification will be seen as a means to discuss localized economic transactions, and the harm or value created by a business enterprise to the common good. We as a nation will make capitalism work to benefit our democracy. The sense of market transparency is enhanced when all, or the vast majority of, individuals have an education designed to increase critical thinking skills. These skills are useful in a social world where new forms of social media create the instant ability for new ideas to gather and to form political force.

Transparency on the educational system itself is part of the mission of the new infrastructure. The current system supporting education is not exactly what the American

society has paid for, and yet there is little real understanding of what happens in the classroom. Each year American citizens directly pay more than eight hundred billion dollars in educational services, *excluding* research funding. However, these large levels of funding are absorbed into the current system, without the possibility of the type of social renewal we might otherwise seek. The door to renewal is closed because we as a society all too often give up our decision making to the mass media.

An analysis of the system, using principles from systems theory, is difficult for reasons that we hope the reader will come to appreciate or already has appreciated. Part of our proposal is very carefully designed to create an objective view about the nature of systemic entrenchment. For example, testing often distorts the learning process in specific ways. Deep learning methods are designed to give the individual more responsibility in providing an objective demonstration of knowledge actually owned by the individual. There is a loss of individual control over a large part of one's life. It is a reasonable step in human evolution to ask that the individual regain control. The educational system should be focused in this single objective, and yet it is not. In some sense, the opposite is occurring.

Obtaining positive outcome metrics will be a primary focus of a bridge between high school and college. Mathematical models of system behaviors related to entrenchment, and to the release from entrenchment, are seen in our preliminary work¹⁰. We expect that this preliminary work will be tested in a clinic setting so that physical measurement of acquired learning disabilities become commonplace.

¹⁰ Prueitt, Paul S. (1996a) Optimality and Options in the Context of Behavioral Choice, in D. S. Levine & W. R. Elsberry, Eds. Optimality in Biological and Artificial Networks?, Erlbaum, 1996.