Teachers College
Educational Technology Conference
2009 Conference Proceedings

Sunday, May 10, and Monday, May 11, 2009
Teachers College, Columbia University
New York, NY
TCETC 2009 Conference Committee

Committee Chairs

• Marion Goldstein, Teachers College, Columbia University
• Antonios Saravanos, Teachers College, Columbia University

Committee Members

• Paul Acquaro, Teachers College, Columbia University
• Carla C. E. Fisher, Teachers College, Columbia University
• Caron Mineo, Teachers College, Columbia University
• Ruth Schwartz, New York University

Acknowledgements

We have many people to thank for making this event possible. First, thank you, Professor Charles Kinzer and the Communications, Computing and Technology in Education program at Teachers College for their financial contributions and enthusiastic support throughout the year. Thanks also to Kenny Nienhusser for helping to fund the conference and guiding us every step of the way. Thank you to the Student Senate for donating funds and resources. Last, but certainly not least, thank you to all of the student volunteers and session chairs. There are too many of you to list individually, but please know that we are grateful for your help – TCETC 2009 would not have been feasible without your help. We’re looking forward to TCETC 2010!

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TCETC 2009 Schedule

* Authors have provided additional information in the Proceedings.

Sunday, May 10, 2009
9:00 a.m. to 9:30 a.m.
Registration (Location: Zankel/Main Hall Entrance)
Breakfast (Location: 109 Zankel/Main Hall)

9:40 a.m. to 11:15 a.m.
Web 2.0 (Location: 263 Macy Hall)
• Session chair: Marion Goldstein
• Designing Learning Environments with Social Media*
  o Frederik G. Pferdt
• Promoting Development of Youth's Leadership Skills in Virtual Worlds*
  o Selen Turkay
• Critter: Social Reflective Learning Around Web-Based Video*
  o Faisal Anwar, Zhou Zhou, Xuyang Shi, and Hui Soo Chae
• “Welcome Home to Facebook”: Social Networking as a Tool for Maintaining Social Capital – A Small-Scale Exploratory Qualitative Study of the Experiences of In-State, Out-of-State, and International Post-Graduate Students Using Facebook
  o Dino Sossi

11:30 a.m. to 1:00 p.m.
Citizenship & Connectivity (Location: 263 Macy Hall)
• Session chair: John Gallagher
• Towards an Advanced Online Forum Design of Deliberative Democracy
  o Ching-Fu Lan, Jessica Blum and Zhou Zhou
• A Cross-Cultural Comparison of Video Game Play in the Domain of Math
  o Dan Hoffman, SeungOh Paek, Zhou Zhou, and Selen Turkay
• Teaching Historical Empathy to Develop Ethical Citizens*
  o Karen Schrier and James Diamond
• Continent-to-Continent: Global Connectivity for Learning*
  o Linda S. Bloom

Language Learning (Location: 173 Macy Hall)
• Session chair: Peiyi (Chris) Lin
• Runesinger: A Case Study in the Coupling of the Elements of Language to the Rules of Play
  o Ethan Kennerly
• Striving for Equity via Evolution of Language: Demographic and Technological Change for a Globalizing Japan*
  o Daisuke Funai
• Division of Labor in Two-Person MMOG Parties and Its Effect on Discourse*
  o YunJoon “Jason” Lee
• Fluensee: A Language Interpretation Application for the iPhone
  o Joann Agnitti, Pranav Garg, Faisal Anwar, and Hui Soo Chae

1:00 p.m. to 2:00 p.m.
Lunch (Location: 109 Zankel/Main Hall)

2:00 p.m. to 3:30 p.m.
Web 2.0 (Location: 263 Macy Hall)
• Session chair: Tucker Harding
• Using Wiki Technology to Implement a Classroom-Based Community of Scientific Practice
  o Douglass Ross
• Live Syllabus: Building an Intelligent Networked Course Syllabus Tool*
  o Hui Soo Chae, Faisal Anwar, Huning Dai, Adam Mitchinson, Pravin Sathe, and Ting Yuan
• THINK: A Design Framework for the Use of Social Networks and Mobile Technologies as Platforms for Situated Inquiry Learning in Science*
  o Chen Kee Ng
• Reading Subjects in Digital Ashes: An Inquiry into Narrative Constructions of Subjectivity on YouTube*
  o Curtis Porter
Understanding Systems (Location: 173 Macy Hall)
• Session chair: Antonios Saravanos
• New Applications of Concept Mapping to Afford and Assess Development of Mental Models
  o Lance Vikaros
• Comprehending Emergent Phenomena Through Direct-Manipulation Animation*
  o Priscilla A. Aguirre
• Kidspiration Computer Software, Tile/Stick Manipulatives and Copying/Drawing Shapes – An Exploratory Comparison of Three Educational Interventions in Perimeter and Area Instruction
  o Dino Sossi, Azadeh Jamalian, and Shenetta Richardson
• Errors in the Classroom
  o Seungoh Paek, Antonios Saravanos, Jin Kuwata

3:45 p.m. to 5:15 p.m.
Culture (Location: 263 Macy Hall)
• Session chair: Kuo-Hsun Hung
• Music, Recording, and Inquiry: Songs as Local Knowledge Objects
  o Mark Dzula
• A New Culture: Digital Immigrants Teaching Digital Natives*
  o Rose Tirotta
• Technology, Identity, and Commitment: The Role of the Internet in South Asian American Women’s Ethnic Identity Development*
  o Mathangi Subramanian
• Indian Diaspora in Second Life: Ethnography in a Virtual World
  o *Devayani Tirthali*

**Posters** (Location: 109 Zankel/Main Hall)
• Implication for Math Game Design Through Mobile Applications: An Evaluation of 30 Online Math Games*
  o *Ting Yuan and Faisal Anwar*
• An Ethnographic View of Beginning an Online Academic Journal – The Journal of Educational Technology, Media and Communications at Teachers College, Columbia University*
  o *Dino Sossi, Azadeh Jamalian, Amy Rae, and Sidra Rehman*
• Using a Collaborative Knowledge Base and Multimodal Composition for Understanding and Applying Rhetorical Devices in the High School Classroom*
  o *Paul Joseph Stengel*
• The Kid Stays in the Picture?: Practical, Moral and Epistemological Issues in Field-Based Digital Ethnography*
  o *Dino Sossi*

**Demonstration** (Location: 109 Zankel/Main Hall)
• Reflective Adaptability of Chinese and American Students in a Mathematics Video Game*
  o *Zhou Zhou, Selen Turkay, Dan Hoffman, and SeungOh Paek*

5:15 p.m. to 6:15 p.m.
  **Workshop** (Location: 322 Thompson Hall)
  • StudyPlace: A Global Commons for the Study of Education
    o *Matt Curinga*

**Monday, May 11, 2009**

9:00 a.m. to 9:30 a.m.
  **Registration** (Location: Zankel/Main Hall Entrance)
  **Breakfast** (Location: 229 Thompson)

9:45 a.m. to 11:15 a.m.
  **Games** (Location: 229 Thompson Hall)
  • Session chair: Carla C. E. Fisher
  • Designing Kid-Friendly Motion- and Touch-Based Interactivity on Digital Devices*
    o *Carla C. E. Fisher*
  • Investigating Gender Differences with World of Warcraft and City of Heroes Players
    o *Selen Turkay*
  • *Lit*: A Mobile Game Intervention for Nicotine Smokers*
    o *Nisha Alex, Azadeh Jamalian, Pazit Levitan, Rosanna Lopez, and Jessica Mezei*
• Advance!: Discrimination Education Through Play*
  o Jessica Hammer, Pazit Levitan, Azadeh Jamalian, and Nisha Alex

11:30 a.m. to 1:00 p.m.
Student Engagement (Location: 229 Thompson Hall)
• Session chair: Marion Goldstein
• Examining the Effects of a Virtual World Based Curriculum on Student Engagement
  o Selen Turkay
• Does the 3D Serious Game Physics Geeks Facilitate Learning in Conceptual Physics Students?*
  o Phillip M. Stewart
• Arguing on the Computer: Towards an Understanding of the Technical and Social Affordances of Computer-Mediated Communication to Foster the Development of Dialogic Argumentative Skills*
  o David Shaenfield, Marion Goldstein, Amanda Holman, and Wendy Moore

Media Literacy (Location: 431 Horace Mann Hall)
• Session chair: Anthony Cocciolo
• Digital Handwriting: The Future of Note-taking and Learning*
  o Gladys Santiago
• The Uselessness of Literature: Why New Literacies Will End Teaching of Literature*
  o Tom Liam Lynch
• Reading “Lucy Through the Wardrobe” from Novel to YouTube Fanvideo: Tween Franchises and Cross-Media Literacies in the Primary Classroom
  o Naomi Elana Hamer
• Educational Research and Sound Studies: A Place for Sound in Education*
  o Brian C. Gregory

1:00 p.m. to 2:00 p.m.
Lunch (Location: 109 Zankel/Main Hall)

2:00 p.m. to 3:30 p.m.
Computer Mediated Communication (Location: 229 Thompson Hall)
• Session chair: Matt Curinga
• Virtual Teaming in Design Courses: A Comparison of Design Collaboration and Outcomes Between Face-to-Face and Virtual Engineering Design Teams*
  o James J. Pembridge
• Wikipedia and the Emanicipatory Pedagogy of Jacques Rancière
  o Matt Curinga and Aaron Chia-Yuan Hung
• Classroom Web Logs (blogs): Support for Teacher-Student Communication and Teacher-Parent Collaboration Beyond the Classroom
  o Ting Yuan, Zhou Zhou, and George Nantwi
• Designing an Online Social Network for Education: Lessons Learned*
  o Caron Mineo, Anthony Cocciolo, and Sharmin Hakim
Active Learning (Location: 431 Horace Mann Hall)

- Session chair: Jessica Hammer
- Intelligent Sensory Integration Educational System
  - Huning Dai and Hui Soo Chae
- Kids Design Online*
  - Rachel E. Harmon, David T. Marshall, and David E. Vance
  - Joann Agnitti, Stephen Asunka, Hui Soo Chae, and Jessica Mezei
- Robotics as a Tool for Embodying Elementary Mathematics*
  - Jonathan Vitale, Eric Carson, and Tim Chang

3:45 p.m. to 5:15 p.m.
Technology Integration and School Change (Location: 431 Horace Mann Hall)

- Session chair: Caron Mineo
- The Relationship Between Computer Use and Standardized Test Score: Does Gender Play a Role?
  - Rachel E. Kay
- The Digital Youth Network: An Educational Program for Bridging Learning Environments
  - Daniel Stringer
- An Engaging Instructional Interface through Universal Design: An Evaluation of 35 Virtual Lessons in the U.S.
  - Ting Yuan and Stephen Asunka
- Technology, Policy, and the Design of Programs in the Educational Administration*
  - Caron Mineo

5:15 p.m. to 6:15 p.m.
Workshop (Location: 322 Thompson Hall)

- Creativity in Video Game Programming as a Pedagogy*
  - Ronah Harris, Cameron Fadjo, Eric Carson, Greg Hallman, and Michael Swart
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Joann Agnitti¹, Stephen Asunka², Hui Soo Chae³, Jessica Mezei⁴
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This article explores the concept of adaptivity within the context of classroom and computational learning tools and environments, and proposes a framework for the adoption of powerful and flexible technology-enabled adaptive learning environments in formal curriculum-based educational settings.

Introduction & Background

Adaptive Learning - also known as Differentiated Learning, Individualized Learning or Personalized Learning - is the use of alternative instructional strategies and available resources to provide learning experiences that meet the different needs of individual learners with the aim of improving learner success and satisfaction. The underlying principle of adaptive learning is that people have different abilities and preferences, and thus, for effective learning by any group of individuals, the traditional “mass instruction” approach to education cannot be wholly effective. Rather, instructional strategies that match the needs and abilities of each individual learner need to be adopted.

Discussions on adaptive education can be traced back to the early 1800s (Wang, 1992), and the general concept of adaptation to individual differences subsequently became central to many education reforms and counter reforms during a greater part of the 20th century, though with limited successes in most cases (Glaser, 1977). The advent of computer and internet technologies during the latter part of the 20th century however provided a fresh impetus, following the realization that these technologies are capable of dynamically adapting content to fit individual real-time learning needs. By effectively applying these technologies, it is argued, learners should be able to customize and control their learning activities according to their individual needs and preferences. Moreover, current research generally point to the fact that effective integration of these technologies into various educational curricula can have positive effects on student learning (e.g. Harvey, 2003; Kiluk, 1994; Salpeter, 1998), whilst emerging educational theories such as constructivism and socio-culturism are directly linked with technology use in instruction (Jonassen, Davidson, Collins, Campbell, & Haag, 1995; Perkins, 1992). K-12 and higher education institutions are therefore adopting these technologies with the aim of creating learning environments that in some cases, will include learner-centered adaptive learning processes in ways that will improve general student learning.

The proliferation of these technologies within schools, coupled with extensive research and development efforts notwithstanding, technology-enabled adaptive learning environments still do not constitute an integral part of mainstream educational practices - a situation which is partly attributable to the lack of a generally accepted conceptual or best practice framework that informs and guides the implementation of these technologies to adaptive instructional practices. Most initiatives - including intelligent tutoring systems (Shute & Psotka, 1995), adaptive educational hypermedia (Brusilovsky, Eklund, & Schwarz, 1998), intelligent pedagogical agents (Johnson et al, 2000) etc. - are thus either research prototypes, or trials of some standards-based systems, driven mostly by commercial interests.

Research Goal

There is therefore the need for more sustained efforts aimed at evolving generally accepted models that can serve as frameworks for technology-enabled adaptive learning in formal education. Such models should guide instructors in the appropriate application of technologies in learning activities in ways that allow learners to decide when and how to take control over their own leaning, provide appropriate scaffolding and feedback and generally guide learners through their adapted course to ensure learning objectives are met whilst enhancing positive learner attitudes and satisfaction.

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In this presentation therefore, we briefly review available literature, focusing on the development and application of some particular adaptive tools and concepts over the past few decades, the design features and theoretical frameworks therein, as well as the reported effects of such initiatives on learning outcomes. Then, based on this review and on findings of studies and trials conducted on some recently developed adaptive tools and resources, we propose and discuss a model for technology-enabled adaptive instruction in formal education. Highlights of such a model involve (but not limited to) web-based hypermedia systems that are capable of:

1. providing instructional alternatives and procedures that meet the learning needs and abilities of individual learners,
2. monitoring the activities of individual users, interpreting these, and dynamically adapting the course path to suit learner needs and preferences as they progress
3. maintaining the learners’ location to pick up where they left off
4. recording all learner access and performance data.
5. providing explanatory feedback and guidance based on learner interaction to increase knowledge retention
6. providing an optional course map that motivates learners by indicating progress, achievements, and percentage of course completed
7. allowing independent, non-linear course navigation
8. providing customizable interface elements, and
9. providing summative assessment tools.

Conclusion

The presentation concludes with suggestions on how educators at all levels can be supported to create such web-based hypermedia learning environments capable of facilitating adaptive learning in most subject areas, and within several educational contexts.

References


Many prejudice-reduction interventions target self-selected groups, and therefore it is hard to gauge their impact on more prejudiced populations. Additionally, emergent (or systemic) bias is particularly hard to understand. By designing an anti-bias game, we believe that we can reach a broad community while effectively teaching about systemic bias. Our design unites the affective and cognitive components of gameplay to create a coherent system of pleasure and to reinforce the game’s central learning message.

Systemic Bias and Emergent Systems

Despite social support for equality, our society still exhibits wide-spread racial and gender bias. For example, women and minorities’ median average incomes lag those of white males by up to 93% (Infoplease, 2009). Both groups are far underrepresented in the House and Senate (OpenCRS, 2009).

That these problems are significant and pervasive is clear. But to what do we attribute these problems? Do we attribute them to the actions of racist or sexist individuals? Or is something more complicated going on here?

Unsurprisingly, this study takes the latter approach. While one cannot dismiss the role of individuals, we focus on the issue of systemic bias – bias that emerges from the interaction of many factors within an organization. Systemic bias can be rooted in unconscious attitudes or in the rules of the system itself (Valian, 1999). However, in neither case do individuals within the organization necessarily have discriminatory intent (Johnson, 2002). The bias is an emergent property of the system.

It turns out that systemic bias is hard to understand precisely because it is emergent. People are not good at recognizing emergent effects (Charles & d’Apollonia, 2003). Even after being taught about emergent systems, people often find them hard to comprehend, and tend to misconceive emergent systems as operating through direct processes.

Just because understanding emergence is difficult, however, does not mean it is impossible. In fact, the relative intractability of learner misconceptions makes it even more important to find better ways of teaching people to understand emergent behavior. If there are factors that work against learners, perhaps we can compensate with excellent teaching methods. These methods are what Advance hopes to develop. By bringing together work on cognition, bias and discrimination, technology, learning, and game design, we believe that our game can help players understand systemic bias better, and by extension, learn about emergent systems as a whole.

Why Digital Games?

Digital simulations are a natural fit for teaching emergence. Computers can model the many simultaneous, interacting processes required to simulate an emergent system. Each individual agent within the system can follow a simple set of rules, yet adapt those rules to the virtual environment. The agent’s rule system can incorporate feedback, both from the agent’s own behavior and from the behavior of its neighbors and environment. These are all crucial features for modeling emergence that computer simulations can provide; Resnick’s StarLogo software is a classic example (1994).

These simulations go beyond simply modeling emergence effectively. They also allow learners to interact with the simulation. Abel’s research, for example, allows users to manipulate an animated simulation of ants or birds, fine-tuning a number of variables to see how the system reacts. Current findings indicate that the
ability to directly manipulate the system helps learners understand emergent behavior (P. Abel, personal communication, September 30, 2008).

Games, however, provide additional features that support learning about emergence. Games are centered on player interaction; not only do they provide the ability to interact with the underlying system, but they provide strong motivation to do so (Zimmerman, 2003). If goals within the game-world require an understanding of emergence, players who wish to succeed in the game must attend to the emergent aspects of play in a conscious, goal-oriented way. A well-designed game can require its players not only to notice emergent behavior, but also to put that knowledge to immediate use.

Games may also be less vulnerable to pre-existing misconceptions about direct agency than other kinds of emergent models. Players are aware of a game’s nature as a system of rules, which may not have a direct relationship to the world at large (Salen & Zimmerman, 2005). Huizinga called this effect the “magic circle” of play (1938). Players’ willingness to suspend their day-to-day understandings may help them be more sensitive to emergent effects.

Finally, games have a far wider reach than digital simulations. In a typical week, online game sites receive over 700,000,000 hits (Nielsen NetRatings, 2008) – and that counts only games played on the web, not across all platforms. It is hard to imagine so many people voluntarily spending their free time on a digital simulation of emergence, however well-designed.

For these reasons, we have chosen to investigate teaching emergence – and, specifically, systemic bias – through a web-based casual game. We believe that a well-designed game can help players learn to perceive emergent behavior, rather than attributing behavior within a system to a single causal agent. We also believe that such a game can change players’ attitudes toward bias in organizations. By distributing such a game to a large audience, the game can simultaneously serve as a research platform and as an intervention in how our society conceives of discrimination.

Cognitive and Affective Pleasure

As Voerderer, Klimmt & Ritterfeld (2004) argue, enjoyment has both an affective and a cognitive component. In designing a prejudice reduction game, therefore, the two components must work together to create a coherent system of pleasure. At the same time, both systems must reinforce the game’s central learning message.

In the game Advance, the player takes on the role of a recruiter faced with a biased organization, and must learn to exploit the system’s bias in order to succeed. Understanding and exploiting the system’s bias becomes a cognitive puzzle. Each job acquired for a client gives the player points, but the player has limited resources and time. This forces the player to uncover the organization’s bias if they wish to maximize their score.

Affectively, the player identifies with their recruiter character, feeling pride when filling a position for a client or frustration when an investment of resources does not pay off. However, we also attempt to humanize the clients our players serve, allowing players to empathize with the experiences of victims of prejudice. According to Gee (2005), this sort of emotional identification promotes the extended commitment required for deep learning.

These two systems reinforce each other to support the game’s central argument about systemic bias. By using cognitive and affective design together, we believe we have created a strongly motivating game, with the puzzle of systemic bias at its heart.

References


Arguing on the Computer: Towards an Understanding of the Technical and Social Affordances of Computer-Mediated Communication to Foster the Development of Dialogic Argumentive Skills

David Shaenfield¹, Marion Goldstein, Amanda Holman, and Wendy Moore
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Three studies are reported on the use of e-chat technology to advance argument skill development. All three of these studies were conducted as part of a three-year evaluation of an argument curriculum that began in September 2007.

Paper 1: Analysis of Year One in a Three Year Argument Skill Development Curriculum (Amanda Holman)

The first paper focuses on the whether a computer-assisted e-chat methodology is a better path to argument skill development than a method focused on teamwork or a traditional teacher led discussion. Three classes of students with 32 students each were compared on pre-test and post-test individual arguments. One class received an e-chat method, comprised of an extended computer-supported argumentive discourse activity. One class received a team method focused on goal-oriented activities completed in small groups. One class received a whole class, teacher led discussion on the same topics covered by the other two classes and acted as a control group. Students in the e-chat method outperformed students in the control group, and performed better than students in the team group.

Paper 2: To collaborate or not to collaborate?: The affordances of collaboration on developing argument skills (David Shaenfield and Wendy Moore)

The second study compares two groups both using the e-chat method. One classroom chatted as individuals over two successive topics with another individual. In other classroom, dyads of participants were formed which argued over e-chat with another dyad. It was found that individuals in the dyadic condition outperformed the individual condition on a pre-post test of individual argumentation skills. The results are discussed in light of the finding that the dyadic condition affords the opportunity for the individuals within the dyad to engage in meta-level discussion about the argumentation activity. Such meta-level discourse had been found to be a critical component to foster the development of sophisticated argumentive discourse skills.

Paper 3: Developing argumentation skills via scaffolded e-chat (Marion Goldstein)

Results from the first year of the argument curriculum evaluation showed that the curriculum is effective at promoting the development of argumentation skills in adolescent learners. What remained to be determined was whether these skills could be promoted more effectively with the use of additional scaffolds during online argumentation. The third paper in this session explored the efficacy of one particular argumentation scaffold, which required learners to assign functional labels to their online arguments. Sixty-four students engaged in 10 online argument sessions with peers. One group of students (n=32) used the scaffold for some of these sessions, while the other group (n=31) never used the scaffold. At post-test, students who used the scaffold performed better on measures of argument recognition; relative to students who did not use the scaffold, they more successfully distinguished between strong and weak arguments and showed a preference for stronger argumentive moves. Results were inconclusive with regard to whether the scaffold also promoted enhanced argument production skills.

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Classroom Web Logs (blogs): Support for Teacher-student Communication and Teacher-parent Collaboration beyond the Classroom

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Blogging is a growing online social networking phenomenon nowadays with about 50% of the teenagers in the U.S. having their own online spaces as shown by statistics (Perseus Development, 2003). On one hand, the field of education in general has begun to characterize the bridge between blogging and schooling, and on the other, individual teachers have discovered the value of classroom blogging, both as an avenue for communication, but also as a tool for giving voice to what their students are learning and how they are learning (Warlick, 2005).

The purpose of this study is to explore how classroom web blogs (blogs) are specifically used as a new channel to enhance teacher-student communication and teacher-parent collaboration and what are the new opportunities provided by classroom blogging. Based on the media richness theory (MRT) of Trevino, Lengel, and Daft (1987) which emphasizes choosing or developing appropriate media formats that facilitate the flow of information in order to enhance understanding of a content area or concept, we analyze the various ways including media format, technologies, and content categories that teachers use blogs in the classroom and examine how classroom blogs are used to support teacher-student communication and teacher-parent collaboration beyond the classroom. Using open and axial coding as well as typological analyses (Kendall, 1999), we explored 60 K-12 classroom blogs and highlight the common features and divergences in the content categories and media tools used within them.

Our statistical summary provides rich findings from the sample, for example, 43% of the classroom blogs were found to be created for elementary classrooms, while 48% were written for secondary classrooms; 62% of the targeted audience for elementary classroom blogs were found to be parents, while 90% of the targeted audience for secondary classroom blogs were students; various video and audio tools were found to be used in different grade levels and subjects, including VoiceThread, Voki, Podcast, Gabcast, i Tune, etc. We further conclude with a discussion of the implication of these findings in teaching students from both the mainstream and minority groups. We offer a variety of recommendations to expand features currently available for classroom blogs.

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Comprehending Emergent Phenomena Through Direct-Manipulation Animation

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This study investigates the influence of using direct-manipulation animation (DMA) (Chan & Black, 2006) for increasing comprehension and transfer of emergent systems phenomena. In an empirical study (N=90), college students were asked to participate in one of three conditions: no manipulation animation (NMA), post-manipulation animation (PMA), and direct manipulation animation (DMA). From these results researchers expect to find that learners in the DMA condition construct more robust mental models of emergent phenomena.

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Continent-To-Continent: Global Connectivity for Learning

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The ability for global learning to take place in real-time has become a common alternative for the various forms of virtual knowledge-based education. An innovative synchronous coaching program, The Columbia Coaching Certification Program at Teachers College in partnership with Columbia University Business School for Executive Education, has developed a global learning model allowing participants to partake in an academic program while maintaining personal/career responsibilities.

The initial technology goals for the program included: establish a world-class coaching program while maintaining the dynamics of continental technology; determine operational technology guidelines that demonstrate the benefits and challenges associated with international online course delivery; identify the various instructional design models for domestic and international collaborative online environments and examine native culture and social factors required for productive educational variables.

This paper outlines the preliminary logistical procedure/practical process that determined the effective connectivity based on local and country Internet protocols, techniques for synchronous simulcast using web-based technology, how instructional design models could be customized to support desired learning, while assessing the value for successful implementation. Concluding with the operational factors that were associated with local culture and social requirements in order to maintain consistent learning pedagogy.

Background of Columbia Coaching Certification Program

During the year of 2007 a new educational program began development and implementation, The Columbia Coaching Certification Program (CCCP). The program established by Dr. Terrance E. Maltbia, Director of Columbia Coaching Certification Program, The Center for Educational Outreach and Innovation, Adult Learning and Leadership Faculty in the Department of Organization and Leadership at Teachers College. In collaboration with Columbia University Business School for Executive Education, focus on corporate learning solutions for business professionals to provide: strategic leadership, organizational change and performance, and continue development to leaders and staff for skill-based expertise using proven strategic learning techniques.

The CCCP conceptual model’s intent is for executives and business professionals who are interested in framing the executive coaching processes used in organizations as a professional development experience with transformative learning potential (Maltbia, 2005). The program is divided into two areas: Internal Coach Intensive and External Coach Intensive. The Internal Coach Intensive is designed for professionals working inside of an organization. The External Coach Intensive focuses on the outsourcing of external coaching businesses.

The Internal Intensive and the External Intensive program begin with a 5-day on-site residential program in New York. Participants receive a certificate of completion at the successful end of the 5-day program. Participants can then apply for the Coaching Certification Program. This is a six month process that includes a Practicum: a weekly 2-hour synchronous session that includes online peer coaching labs, a coaching mentor, practices and tools allowing participants to integrate personal coaching experience. Participants can continue the coaching experience with the Advanced Coach Intensive. This explores strategic and tactical coaching methodologies to build leadership capabilities while enhancing organizational performance.

To date, the program has successfully graduated the first cohort of External Intensive and Internal Intensive candidates; including participants from the United States, Germany, Poland, India, Vietnam, Singapore, Japan, Sweden, Brazil, Hong Kong, Denmark, China, Romania, Netherlands and Argentina.

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Implementation of Technology for Global Connectivity

The initial descriptions for technology performance, in collaboration with Dr. George Schuessler, Director of Computing and Technology at Teachers College defined what tools were available for online course delivery at the college, so that the Coaching Practicum could run successfully on a weekly basis. It was concluded that Adobe Connect would be used for the weekly Practicum sessions.

Adobe Connect is an enterprise server-based course management and web conferencing software that allows for multimedia interactivity, voice over IP (VoIP) system, real-time communication and presentation (Adobe.com, 2008). The system also allows for recording of sessions for later review. Adobe Connect can be customized so that virtual class management is adaptable to various types of learning production while maintaining educational integrity. The challenge became how to make a synchronous educational program function productively while simulcasting to several continents.

Several factors were identified prior to the start of the Coaching Practicum sessions. What countries were the participants living? Travel to? How/where participants connect to the Internet and log-in to Adobe Connect? What connection type were participants using? What experience did participants have using computers and problem solving Internet issues? Then, based on country and regional information: What were global computer and Internet browser requirements needed to view Adobe Connect sessions successfully? Connectivity of local and country Internet protocols were reviewed as well as corporate and institutional policies by geographic location. So that synchronous simulcast techniques could be incorporated using web-based technology.

Additional operational factors included local culture and social requirements for Internet access. As the coaching programs technology operational structure began to define and support the goals of the CCCP, regional cultures, artifacts and symbols and continental identifiers impacted the way the technology team supported participants. Through the use of native language idioms, jokes, side bar comments and sharing stories of home towns and family. Once an agreeable understanding between the tech support and participants was in place, technology support and tutorial assistance was productive.

Next Steps

To date various multimedia resources are available for the coaching program: simulated tutorials, guidelines, pre-Practicum online Adobe Connect sessions and one-on-one support. Technology operation guidelines have been implemented to monitor and maintain IT servers.

Additionally, new dedicated servers have been setup for greater broadband capacity and Internet integrity as well as upgrading Adobe Connect Professional allowing for more multi-levels of participant interaction. Continue review of IEEE, W3.org and the European Distance Learning and E-Learning networks allowing TC to expand global compliance to support the dynamics of online and mobile learning to support further collaboration between Teachers College and global partnerships.

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Creativity in Video Game Programming as a Pedagogy

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The study of children’s creative thinking as they use technology to produce works of art, has only gotten humble attention in the literature (Loveless, 2002; Resnick, 2006). Although within the learning sciences, and in the field of new literacies studies, a growing number of compelling articles have made attempts to document the creative acts of young people using technology (Kafai, 2006; Sefton-Green, 2006; Gustavson, 2007; Squire, 2008), it is evident that there is little agreement on how to clearly conceive of this thing we call creativity. Quite often, when documenting the practices related to making things with technology, creativity is defined as the process of active engagement, some call it play (Lindqvist, 2003). Nevertheless, as we can identify through much of the data, not all children engage in the process of design and production in the same way, or to the same degree. This highlights how paramount the role and the thinking of the creative agent is to the act, and why it is in need of further investigation by psychologists, social researchers, designers and educators (Middleton, 2007).

Additionally, it is vital to recognize that the technology plays a unique role in the process of creative expression (by scaffolding and supporting design with abstract representations) (Dede et. al, 1997; Bransford, 1999; Black, 2006). How then, can we say that all of these acts are creative? Furthermore, there is great and ever growing diversity of what new things individuals and groups actually make with the technology – from video games, to blogs, to music. Some maintain that with the study of creativity in children all products that a child or youth produces should be considered creative (Amabile, 1996), despite acknowledging that creativity must be cultivated and developed. Can we assume that all the products young people produce with technology are creative?

This paper will present findings from a study that undertook an examination of the iterative design process, and how certain cognitive skills relate to creativity. The study examines a group of boys ages 9 – 11, who participated in a 12 week long video game design course at an elementary school in New York City. The course focused on the design of video games, with curriculum that introduced computer programming, mathematics, storytelling, and the digital arts. This effort was also grounded in the theory of media literacy, examining how video games and interactive texts extend the new literacy paradigm (Gee, 2003; Leu et. al, 2004). The course was offering after school and both qualitative and quantitative analysis was employed. Observational methods of research, including field notes, student interviews, were employed to examine the social relationships and the dynamic learning environment. Additionally, student work including storyboards, art and video games code, serve as a major source of data.

This paper will share specific (cases) instances of when creative thinking was developed, and discuss ways for teachers, and designers to reconsider creativity in this digital context. During Spring 2009 we are extending our program into two schools and we will share data from these programs as well. This session will also be held as a workshop to introduce those who are unfamiliar with programming with young children and the Scratch program to come and find out about the possibilities.

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Critter: Social Reflective Learning Around Web-Based Video

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This article describes the rationalization and design of a web application called Critter, a tool that supports video-driven discussions among social groups. As an example application, we envision mentor teachers and novice teachers conducting professional development virtually: one teacher posts a class session online and shares it with other colleagues who provide interactive feedback to help improve practice. Such discourse among professional communities can be extended to doctors, lawyers or others who also have a need to conduct critical and reflective conversations with peers. Similarly, we imagine users discussing their favorite movie with a group of friends or a video relevant to the lesson topic with teacher and classmates through the Critter platform.

Many emerging and fast-growing web-based video-sharing technologies such as YouTube have raised the keen attention of teachers, educators, and researchers due to their potential in improving education. Similar technologies are being adopted in an increasing number of educational settings such as teacher blogs, school websites, classrooms, and distance learning courses with the purpose of leveraging the potential of digital media in learning. The benefits of video-driven educational tools include flexible access in terms of time and location, creative instructional design opportunities, extendable learning on related topics, and motivating and engaging approaches to learning (Snelson, 2008; Trier, 2007a, 2007b).

However, Snelson (2008) points out that the challenge of effectively using web-based video-sharing technologies for education is that most existing technologies are not designed for use in educational settings. To examine Snelson’s viewpoint, the developers of Critter conducted market research in January 2009 on some available video technologies and their potential in education. We specifically examined the following tools:

- The Cross Media Annotation System (XMAS) – A tool developed by MIT’s Shakespeare Project for the specific purpose of teaching classical literature.
- Omnisio – A commercial application recently acquired by Google, Omnisio provides many powerful enhancements to a basic online video watching experience. Users can create and share comments about a video that are linked to the timeline. They can also associate alternative media such as Powerpoint presentations with a video.
- YouTube – This is one of the most popular video sharing web applications providing users the ability to upload videos, comment on existing videos, and search videos based on a range of criteria.
- Nico Nico Douga – A popular Japanese video sharing application providing a platform for simulated real time conversation on top of the video.

We concluded that while each of these tools provides some potential benefit in a learning context, there is no one system specifically designed as a pedagogically adaptive environment for conducting conversations around video. Based on existing research, we believe video-driven conversations organized around specific learning communities (classes, professional groups, networks of friends, etc.) have untapped potential to redefine online learning (Borko, Jacobs, & Eiteljorg, 2008; Sherin & Es, 2005; Wang & Hartley, 2003). Not only can such conversations facilitate teacher-student learning paradigms, but they have the potential to redefine how training and feedback are utilized within professional learning communities such as teachers.

We have conceived Critter as a tool to support online, video-driven discussions among individuals within a learning network. Our design is informed by existing educational research on video-assisted learning, computer mediated communication, and multimedia design. According to the literature, Critter fosters meaningful learning because it encourages learning activities with the following characteristics: active participation, relevance to personal experience and interests, efficient and adequate social interaction,

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contextualized learning, proper guidance, and emotional involvement (Karppinen, 2005; Tu, 2000). In addition, the software can scaffold reflective learning as it can help students visualize learning process, externalize thinking, make comparisons between expert problem-solving processes and their own processes, or conduct reflective social discourse (Lin, Hmelo, Kinzer, and Secules, 1999).

Based on this research, we have identified some key design features to be incorporated in Critter:

a. Users on the site can organize themselves around social networks consisting of friends or specified groups (e.g. classes, clubs, professional organizations, school-specific faculty).

b. Discussions can be created around specific videos and within specific social networks. A central feature of Critter’s discussion model is that it encourages conversations that can be limited to participating members of a particular learning community. This is in contrast to most other models where discussions are unrestricted to all users.

c. Each discussion consists of comments that either are linked to the video timeline or are general comments about the video.

d. Critter’s commenting system includes features that enable deep analysis of a video-driven conversation. Users can search for specific comments within a discussion. They can also access links between comments and the video timeline and filter comments by discussant.

e. Users will receive statistical cues regarding the popularity or relevance of a particular video, discussion, or comment, based on which they are able to improve their future learning or professional development activities driven by Critter.

f. Critter can be customized for mobile devices or provided as a plug-in within existing web content.

These features make Critter an especially appropriate tool to facilitate learning around videos by allowing interaction with the contents of videos and fellow discussants. As of May, 2009, our team (consisting of graduate students and professionals at the EdLab) has completed a workflow and architecture for the Critter system and is actively implementing the system.
Designing an Online Social Network for Education: Lessons Learned

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Introduction
The authors of this proposal are currently involved in the design and implementation of an online social network to engage students in communication and action around nutrition and obesity prevention. The project has involved three key phases: (a) the design and development of a content-relevant online social networking tool, (b) the online professional development of key players, including, after school teachers, college mentors, and program administrators, and (c) the implementation of the online social network across twenty-two after school programs for students in grades 3 – 8. At the time of TCETC 2009, the project has been in the implementation stage for nearly four months.

Background
Technology can be a catalyst for improved teaching and learning in both formal and informal educational settings (Wenglinsky, 2005). Still, this finding remains dependent on both the design of technology and the design of implementation. The International Society for Technology and Education (ISTE, 2008) recently recommended seven key conditions for use in support of student learning. Of those recommendations, five translate to the design of technology programs for after school use:

1. Professional development is needed to prepare educators to design and implement technology experiences for learning;
2. The application of technology for student learning must be embedded within the context of a thoughtful curriculum;
3. Technology must be integrated into the daily activity of students. Technology will not support learning if implemented as an occasional “add-on” activity. See also Kulik (2003).
4. Collaborative environments for technology are most effective for learning. See also Kulik (2003).
5. The support of knowledgeable leaders is central to the successful implementation of technology for learning in education. See also Meier and Mineo (2008) and Mineo and Meier (2008).

The authors had the opportunity to apply these understandings to the design of an Online Social Network for use within twenty-two established after school programs across three major urban areas in the northeastern United States. This pilot project was the second stage of a larger grant initiative. In the first stage of the project the authors’ partners, a national practice and research institute for after school education, developed a curriculum around issues of nutrition and community building. Pilot after school sites had been in operation for six months prior to the introduction of the Online Social Network.

Online Social Networks have been shown to engage participants around pertinent issues and potentially influence lifestyle change (Mankoff, Matthews, Fussell, Johnson, 2007). When designed properly, Online Social Networks can support collaboration for learning by engaging students in daily conversation and reflection around important topics. The authors were cognizant to include features in support of collaboration within the design of the Online Social Network. However, the placement of a feature does not guarantee the thoughtful use of the tool. That said, the involvement of teachers in this process is key. Teachers still need to scaffold learning within the environment. In this way, the authors’ offered professional development to

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facilitators, college mentors, and program administrators to support the thoughtful integration of the Online Social Networking into the after school curriculum. Professional development topics included: writing essential questions to generate student discussion, involving parents in the Online Social Network, and using video to enhance learning activities.

Research Approach

The authors have taken a design based research approach to the current project. This methodology has recently been regarded as essential to the development of educational programs in context. Barab and Squire (2004) said, “Design-based research is not so much an approach as it is a series of approaches, with the intent of producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings (p. 2).”

While the funding for this project has come to an end, the authors intend to use this project to guide the design and development of similar programs. In order to leverage this experience, we ask: How does the design of a content-relevant Online Social Network foster meaningful educational use? What are the conditions for success, as measured by student engagement and learning?

Formative data is in the process of being collected to inform the collective understanding of project partners. Data sources include design notes, feedback from administrators, feedback from after school facilitators, informal data regarding access to technology, recordings of professional development webinars and related chat logs, and additional archival records pertaining to site usage (e.g., blog postings, recipe exchanges, profile creations).

Preliminary Findings

The authors have taken notice of several emerging themes through a preliminary analysis of data, including:

- Site design driven by student privacy issues and curricular goals
- Site influences professional communication between facilitators, across multiple after school programs (collegiality)
- Site supports the documentation of student service initiatives at a number of programs. At the same time, blog postings have primarily been initiated by teachers for presentation purposes.
- Access to the Online Social Network is essential to implementation.

Discussion

To realize the catalytic power of these types of technologies, we must be thoughtful about the entire process. This includes, the instructional design of the tool, capacity building at the site (i.e., addressing access, and professionalizing staff), and thinking deeply about instructional goals to design technology-infused activities for inclusion into the curriculum/scope and sequence of activities.

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Designing Kid-Friendly Motion- and Touch-Based Interactivity on Digital Devices

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Digital media is an important part of children's lives. For example, 82% of children ages 2-5 play games on digital devices (NPD, 2009). Another study found that children ages 0 to 6 average more than 90 minutes of screen media and 59 minutes of television use a day (Rideout & Hamel, 2006). Nearly 20% of the best-selling computer game super genres in 2007 were family or children’s entertainment titles (ESA, 2008). Further, 20% of children ages 4-14 own a cell phone (NPD, 2008).

Despite the popularity of children’s digital media devices, products, and software, development resources generally gloss over information on developing interactivity for kids, often just implying that the younger the child, the bigger the buttons and the shorter the words. However, when designing interactivity for children, especially preschool and elementary aged children, designers often work in a vacuum. Developers might create products that they believe are interesting for children, but never have the opportunity to interview or watch children play with the prototypes before performing evaluative studies or even releasing the product commercially. Even those who play lots of children’s games and toys are far removed from experiencing the cognitive changes and motor skill challenges that are a hallmark of the developing child.

The above circumstances leave research projects at risk for usability problems that, in turn, potentially compromise any educational findings. While understanding how the developmental needs of children affect design is often best achieved through dedicated research, usability studies, and focus groups, it is the position of this paper that existing research findings from a variety of fields can be leveraged to inform the design process and minimize the risk of usability problems.

The proposed session will focus on reviewing existing research that developers and researchers alike can use, with particular emphasis on research that provides insight on children's use of motion- and touch-based interactions.

For example, when considering children’s interactions with touch-based interfaces, the discussion will first review the relevant fine motor skills developmental milestones and comparisons of various types of digital input devices, such as the computer mouse, stylus (Nintendo DS), or touch-screens (Apple iPhone) (e.g., Revelle, Medoff, & Strommen, 2001; Hourcade, 2002). It will be followed by a review of research specific to touch-based digital interactions (e.g. Strommen, et al., 1996) as well as relevant non-digital research, such as children's evolution of pencil grips (e.g. Schneck & Henderson, 1990) and pointing as early communication (e.g. Iverson & Goldin-Meadow, 2005).

In this way, the discussion will also touch on basic principles of multimedia product design for children, including interaction control and target-size as well as the use of scaffolding and artificial intelligence to further enhance interactivity. Attendees will take away findings from existing research on kids and digital media that can be incorporated into their own development projects.

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Designing Learning Environments with Social Media

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Social Media is changing the way we learn and offers potential for the design of innovative learning environments. But how can we use these technologies to improve learning and design learning environments? This research shows some insights of a three-year school project using social media in learning environments and offers an innovative research approach producing theory and solutions to problems of educational practice for a change in education.

Problem-design

In the educational discussion about using technology to enhance learning, one focus is laid upon new technologies like Web 2.0 and social media. It is said that these technologies have the potential to offer new solutions for learning and teaching. Different research shows that the usage of new technologies such as social media and Web 2.0 are aligned with tremendous changes for the socio-cultural world and the individual and collective living environment (life-world) of individuals and groups. In this sense, social media simultaneously drives developments forward and challenges the situation and there is lots of possibility for learning with social media but teachers haven’t been successful incorporating into classroom and the need of finding media-didactical concepts, instructional designs and solutions for learning and teaching with social media is increasing.

Social media can be interpreted as a generic term for simple and flexible web applications, which support co-operative sharing and editing of content. Essentially, social media is “social” only in the specific context of cooperation and sharing, and the added value emerges through the participation of users. Four main characteristics of social media can be identified: Participatory media creation, identity building, networking and public knowledge space. So it can be claimed that social media is not so much a technological innovation but more a philosophy of how to communicate, collaborate, and participate on the web.

In the context of education, social media offers various opportunities for a learning-centered approach as it allows the provision of the essentials for productive learning, such as interaction between individuals, independence of time and place, collaboration, feedback and support mechanisms as well as providing learners with additional capabilities concerning knowledge creation.

Based on these potentials of social media for learning, I address in my research the following question: How can learning environments be designed with social media?

Research-design

The aim of my research is firstly to introduce empirical and theoretical studies about the influence of social media on individuals and groups, and to analyze the specific potential for learning and teaching based on the current discussion in the educational technology research literature.

Educational design parameters, based on the constructivist and constructionist learning paradigm, offer a solution to the problem of tacit knowledge as they focus particularly on the problem-based situation and the orientation towards genuine problem definitions, as well as on situated cognition and collaboration between learners. The position of constructivist learning theories emphasizes the need to create meaningful learning environments, which are designed as authentic problem contexts. Social media offers possibilities to achieve learning as described as it can offer the designing of learning environments on these education design parameters and of constructivist theory. Social media in this understanding supports the learning process as tools and fosters active knowledge construction.

Secondly, the main part of the research consists of the design, theoretical grounding, examination and

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evaluation of two designed and implemented prototypes of learning environments with social media in a three-year design project in a school in Germany. The research project “KooL” (co-operative learning in web-based learning environments) is part of a research program in vocational education in Germany. The design, implementation, evaluation and re-design are conducted, not only by the researchers at the Department of Business and Economics Education at the University of Paderborn, but jointly with teachers at a vocational education school in Rheinbach, Germany. In this research project, social media like weblogs, wikis and podcasts are used to design the learning environments in vocational education and two prototypes of learning environments are developed collaboratively between teachers and researchers.

The research will highlight the main ideas of educational designs of learning with social media based on the experience of this three-year research project, where data was drawn from a quantitative and qualitative approach using online questionnaires and a causal online sentence completion questionnaire, where teachers and students had to give reasons for their answers concerning questions for teaching and learning with social media. 555 teacher and 1051 learner causal answers were produced and analyzed using a qualitative content analysis method. The answers give access to the successful usage and problems of social media as a tool for designing learning environments.

This detailed description and analysis of the conditions of the respective learning environment provides insights concerning the usage and the design of learning with social media and thus will help others to use social media efficiently in educational settings.

Research in this field often produces impressive empirical data, but at the same time fails to offer solutions for practical problems and transferable designs for learning and fails to have impact on educational organizations. Consequently, the question regarding an adequate research paradigm, which combines two diametrically opposed poles – basic and applied research – is crucial. Basic research, on one hand, is a research position, which is characterized by the objective of gaining more knowledge, data or understanding of a subject or field of study, without having a specific application of theory in mind. This research is often interpreted as testing theoretical hypotheses to produce universal theory in an experimental design, and participants are subjects, who are assigned to treatments. On the other hand, applied research is aimed at using knowledge to solve a specific practical purpose or problem.

For this reason and lastly, a heuristic framework – the design-based research approach (DBR) – is derived and this paradigm is used as a methodological framework in the research project. DBR offer solutions to problems of educational practice and, consequently, provides communicable developed theories, which are context-sensitive, useful for educational practice and ultimately increase scientific knowledge on learning and teaching.

Solution-Design

This research provides interesting insights about the effective use of social media in enhancing teaching and student learning with social media. Through these insights, a model of design principles for designing learning environments with social media will be developed. It is hoped that the insights as captured in this research will influence the future design of teaching and learning in education, in particular regarding the ne(x)t generation and will provide innovative ideas for teacher education.
Digital Handwriting: The Future of Note-Taking and Learning

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De-emphasizing the practice of handwriting in a digital world leads to confusion and the development and acceptance of “cut-and-paste” research and writing methods. This paper identifies digital handwriting as a possible solution to counteract the passive and potentially plagiaristic form of content creation that cutting-and-pasting encourages. Digital handwriting is defined as the combination of traditional writing by hand with innovative and interactive computer peripherals that come in the form of electronic tablets and styluses.

Extended Abstract

Handwriting plays a pivotal role in learning and is quickly being devalued in favor of computer skills. Handwriting, more specifically, cursive writing has been described as an antiquated practice and according to a 2007 US Department of Education funded study, teachers only spent an average of 70 minutes per week teaching this form of writing (Mehegan, 2009). Contemporary children are immersed in digital communication and web-based environments at incredibly young ages. Their literary education begins and centers on technology and ubiquitous access to information, which may result in their inability to distinguish their roles as reader and writer.

It is important to stress that “Handwriting [sic] has never disappeared in the wake of new technologies, but has always adjusted its use and meaning in the face of larger technological, social, and cultural transformations” (Neef & Van Dijck, 2006, p. 9). I define digital handwriting as the combination of traditional writing by hand with innovative and interactive computer peripherals that come in the form of electronic tablets and styluses. This paper asserts that handwriting is an interactive activity, and its merger with new technologies appeals to the online media-centric learning styles that have emerged in recent years. Because of products like those sold by Wacom, Livescribe and SMART, handwriting is likely to evolve into a hybrid practice that combines old and new communication tools, and introduces the physical body to digital creation.

One of the goals of this paper is to address how handwriting effects the way we think, learn and remember. Part of this discussion is will be framed through Martin Heidegger’s view regarding the importance of the human hand in writing and J.C. Nyíri’s description of how Friedrich Nietzsche’s writing and thought process changed when he began using a typewriter. Through cut-and-paste, students are distancing themselves from text and decreasing the likelihood of memorizing and learning material. Contemporary media devices and learning culture significantly risk atrophying hand motion by encouraging mundane, repetitive tasks like scrolling, pointing and clicking and drag and dropping. The way we organize our thoughts is becoming less reflective and analytical and more conducive of storage. Furthermore, memorization loses its significance when information can easily be found through a keyword search.

In his essay “A Note Upon the ‘Mystic Writing Pad,’” Sigmund Freud identified writing as an external catalyst to memory and “...described memory in terms of writing, comparing it to the surface of a writing pad that allowed the scribbling of endless notes, which could subsequently be erased and yet remain stored in the ‘subconscious’ layers of the pad, below its material surface” (Van Dijick, 2004). Handwriting aids in retrieving, reconstructing and storing memories and thus, is an integral process in the creation of an archiving machine.

I argue that handwriting is a foundational practice which directly influences literacy skills such as, spelling, reading and writing. The widespread use of electronic tablets and other interface technologies will culminate in a digital handwriting evolution in which computer users repel from the banality and repetitive structure of the keyboard, toward a more holistic practice that is deeply intertwined with memory formation and learning. In his 1950 Reith Lectures, biologist J.Z. Young discussed “the subtle ways our perceptions, ideas, and language change whenever we begin using a new tool” (Carr, 2008) and recognized that “Our
technologies [sic] make us as surely as we make our technologies” (Carr, 2008, p. 227-228). The writing equipment we use, whether it is a pen, typewriter, computer keyboard or electronic tablet and stylus, significantly changes how we formulate our thoughts (Nyíri, 1993).

This paper examines what the cognitive implications are of not writing out and emphasizes handwriting as a learning tool. Strategies for utilizing electronic tablets and styluses to improve note-taking skills and language development are explored. Heidegger (1999) states, “Every motion of the hand in every one of its works carries itself through the element of thinking...Thinking guides and sustains every gesture of the hand” (p. 112). Digital handwriting stands to become a learning and communication medium that nurtures cognitive performance and promotes collaboration through online environments.

References
Division of Labor in Two-Person MMOG Parties and Its Effect on Discourse

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As Teachers we forget how important it is to consider the student’s ability to think. Playing MMOG game shows how important teachers roles can be in education. We might find the results that teacher want, but tend to forget about the discourse dominating over the student’s discourse. I want to suggest difference lens to teachers in language education.

General Notes

Over the past years we have seen many teaching methods and approaches to developing students’ language abilities. Many students have benefited from these methods and their language proficiency has increased, but there are always students who fall behind in class. What have we done for these students? For some time many people thought using Chomsky’s approach would help the student to develop. Other researchers and teachers studied and found different approaches. Are these students floundering because we have yet to discover the right method? Or is the student failing to develop adequate language skills because they simply aren’t “smart” enough? According to Michael Stubbs (1983), students are not developing the necessary language skills because the teacher’s discourse is too messy for the students to understand. This is the issue that I want to explore: how can a teacher’s discourse interfere with a student’s education.

My theory is that the teacher’s discourse can interfere with the student’s discourse. Students have their own minds and ways of thinking, but is the teacher’s discourse restraining their freedom? The teacher has the dominant discourse in the classroom, and that is very powerful, and can affect a student’s ability to learn. Student centered is the model for teaching nowadays, but if the teacher still dominates the discourse, what happens to the students’ discourse? Foucault describes discourse as a power relationship. Discourse positions people in different ways socially; it also establishes hierarchies (Walshaw, 2007). The teacher’s discourse could overpower the student’s discourse. This could lead to a blocking of a student’s freedom of speech and action. In this presentation, I will analyze a set of transcripts from the massively multiplayer online game, World of Warcraft to show how the teacher discourse can interfere with the student discourse.

An MMORPG game such as World of Warcraft (WOW) provides an environment to allow the student to feel relief from the learning discourse, so that the student can be free of the “school discourse.” Also, the online environment gives the student time to read and to understand the importance of reading. In WOW the student must read to understand the important parts of quests, and what action those quests require. After understanding the quests, the student can also engage with other players through negotiation and collaboration.

The pilot study that I conducted was to see how the student would take on the responsibility of a leader. As a leader, the student would have the responsibility to guide the quest and therefore would have to work harder than usual. I also thought this could motivate the student. At the beginning part of the study, interaction was mainly about asking information about the quest and confirming the information that you received. I didn’t expect more than simple and short conversations to occur between the leader and the follower, but wanted to see as much interaction as possible. However, after a while of playing the WOW, I did an interview with the subject, and he told me that he felt uncomfortable and felt that he was being oppressed by me, the teacher/follower.

I was unconsciously restraining the student during the process. I might have seen the result that I wanted, but if the student didn’t feel comfortable and felt stressed due to the workload of this study, can I say this study was a success? The gaming discourse had turned into an educational discourse for him and as such made him uncomfortable. He stated that the game had become boring and that he did not want to play anymore. This was a sign for me to alter the study.

During the second part of the study, we still played WOW but this time I was the leader, which took away the burden of leadership from the student. The game was played in the same structure, but I was now telling

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him what the quests were and where to go. The student became the ‘follower’ of the game. In other words, I gave him his space and freedom to think. The result was very different.

The student started to burst into conversations. It had only been a couple of days since I took away the leader’s role from the subject, but a radical change in the student’s interaction was observed. He was making comments, helping others and asking more about the quests. He didn’t restrict his interaction to gaming but also talked about his social life, his school and other events. This had never occurred before. As soon as the discourse of the teacher was removed, the student was able to express himself freely. Can we say the teacher’s discourse had previously interfered negatively in the student’s learning? The power of the teacher is so massive it is sometimes difficult for the student not to be oppressed by the teacher’s discourse.

Through this study I wanted to note that teachers should try to notice the power and nature of their discourse in the classroom. By taking away the teacher’s discourse the students could be free to develop their own knowledge of language. The traditional educational system is based on a teacher – student input system; the teacher teaches and the student learns. This way of approaching education is generic and does not allow each student to explore his/her own knowledge of language. I do not want to say that my study has discovered the ultimate method of teaching, but rather I want to suggest it as a different lens for teachers to view learning in language classrooms.

References
Does the 3D Serious Game Physics Geeks Facilitate Learning in Conceptual Physics Students?

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The current study explored what happened when the 3D simulation game Physics Geeks (http://www.physicsgeeks.org/) was brought into a classroom to facilitate teaching and learning of conceptual physics. In this quasi-experimental design, two groups received similar instruction, but the experimental group played the game before taking the posttest. Students in the experimental group had significantly higher pre-posttest score gains than those in the control group, \( F(1,11) = 5.14, p < .05 \).

3D Games and Physics Learning

More than 95% of young people 12 to 17 play video games, including 94% of girls (AP, 2008), and many of them play often, with the average 8th grader playing about 5 hours a week (Gee, 2007). Despite the widespread use, educational researchers are just beginning to explore the potential of games facilitating learning in the science classroom. Price (2008) examined the fidelity of the Unreal Tournament 2004 (UT2004) physics game engine as a teaching tool. Using the game's UnrealEd feature to create immersive environments, or virtual worlds, the researchers discovered that the game could produce both qualitatively and quantitatively believable experiences in physics with few caveats. Learning outcomes were not examined as part of the research, but students had better learning experiences using the game alongside most concepts, and teachers reported high fidelity for the physics engine to “generate numerical results that agree with physical reality” (p. 336). In previous research on the use of a virtual reality physics game as a cognitive tool facilitating conceptual learning in science (Songer, 2007), Squire, Barnett, Grant, & Higgenbotham (2004) found that playing the game alongside instruction led to significant pre- to post-test gains in learning over the control group and that “the primary affordances of games as instructional tools may be their power for eliciting students’ alternative misconceptions and then providing a context for thinking through problems” (p. 517).

The Game

Physics Geeks is a series of 3D virtual world modules and is considered an agenda-driven serious game (Chen, 2005) because it tries to maximize entertainment value through game design principles while serving a primarily pedagogical function. The game was conceived and created by the Virtual Learning Worlds team at Columbia University with a National Science Foundation grant. Susan Dreher was the primary software developer, Rob Lane was the project manager, and I was the educational specialist tasked with designing the educational content of the virtual worlds. The game was programmed in Adobe Flash using the Havoc physics engine, an industry standard. Physics Geeks is a virtual world with eight unconnected modules. One day these modules may be connected in one large virtual world, but for now each module is a concept-targeted space where students interact with the environment and then answer physics questions based on their interactions in this environment. Players can also probe the concepts in each module, navigating to a links tab which guides them to related internet resources.

Each module has a small scaffolding feature where certain actions trigger “light bulbs” which point out interesting actions or prompt students to notice or try something specific. These light bulbs are more like “Easter eggs”, or hidden features which are not revealed upfront but rather emerge from dedicated play. As gamers rarely read game manuals anyway, learning more effectively through trial and error with the game itself (Gee, 2007), these light bulbs serve as a motivator for players to keep playing in order to find them all. Another motivator is the “test” which accompanies each module—players take the tests and receive a score

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along with a report telling them which questions they answered incorrectly. Players may return to the game and take the test as many times as they like until they get a perfect score of 100/A+. Physics Geeks is housed at Facebook <http://www.facebook.com/>, and each player earns a grade for each of the eight modules and an overall grade which (a) compares them to their Facebook friends who also have the game and (b) labels their success (or lack thereof) by giving them a level of Physics “geekiness” (as in, Level One Physics Geek).

Population, Data, and Results
The subjects chosen for this study came from the exact population for which the game was designed: two classes of fourteen 9th grade students enrolled in a physics course as part of a Saturday school program in New York City. Students in the program were drawn from the population of students just on the border of passing their Regents exams. Students were enrolled in a course on conceptual physics covering the topics of variables, inertia, and sound. We sought to determine if students achieved improved pre- to post-test scores and conceptual growth after playing Physics Geeks. Only the inertia dimension of the study is examined here. Unfortunately, only thirteen of these students were present for both Saturdays of the inertia unit. Most underserved students are not provided the motivation to learn science (Price, 2008), and the enormous motivational potential of games make this the ideal population on which to test the game. The game was designed with constructivist learning principles as a guidepost, and as such the study is firmly rooted in a constructivist theoretical framework. The data collection methods reflect this framework, as each piece aims to illuminate learning in a constructivist way. Students were expected to engage with the game in a cyclic process as Gee (2008) suggests: reflectively probing the virtual world, forming informal hypotheses, re-probing the world with the developed hypothesis in mind to discover effects, and responding to those effects as feedback to refine or rethink the initial hypotheses.

Data collected as part of the course included a pretest, an identical posttest, and field notes of student play experiences. The pretest was a battery of 21 short-answer, conceptual physics questions adapted from conceptual physics texts (Karplus, 2003; Hewitt, 2002) and designed in consultation with a Karplus scholar; the six questions covering inertia were examined for the current study. Students in both groups received identical instruction rooted in constructivist pedagogy: prior conceptions were elicited from students which led to discussion, demonstration, and cognitive conflict. Students in the experimental group then played the game while students in the control group received more instruction, involving either a physical experiment or guided activity. A 2x2 ANOVA was performed on the data with assessment time as a repeated measure and the F test was significant, F(1,11) = 5.14, p < .05, indicating that the experimental group had significantly greater score gains over the control group (see Table 1). The partial eta squared for the test was .319, lower than Cohen’s recommended heuristic value of .8 (cited in Judd, McClelland, & Ryan, 2009)—unfortunately, this eventuality could not be avoided because of sporadic student attendance at Saturday school. Qualitative findings from the field notes were in line with current games and learning research and further validated by the qualitative differences in student responses across groups; the goal-directed nature of play is what can facilitate effective pedagogical uses (Gee, 2007), games provide unique motivational power (Price, 2008), and game spaces can serve as digital laboratories where students can think through their conceptions (e.g., Squire et al., 2004; Gee, 2007). Results can inform researchers attempting to gauge the usefulness of virtual worlds in the classroom to facilitate science learning, and for teachers who wish to use Physics Geeks or other 3D games to facilitate science instruction.

Table 1: Comparison of means and changes in pre-post assessment scores.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Pre-Test</th>
<th>Std. Dev.</th>
<th>Post-Test</th>
<th>Std. Dev.</th>
<th>Gain score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>7</td>
<td>1.29</td>
<td>.95</td>
<td>3.00</td>
<td>.82</td>
<td>1.71</td>
</tr>
<tr>
<td>Control</td>
<td>6</td>
<td>1.75</td>
<td>.42</td>
<td>2.00</td>
<td>1.45</td>
<td>.25</td>
</tr>
</tbody>
</table>

References


Educational Research and Sound Studies: A Place for Sound in Education

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General Notes
There has recently been a focus in the field of New Literacy Studies and Media Literacy on the ability of communication systems visual, spatial, multimedia, and sound to contribute to learning in social environments and education. Sound Studies, a new interdisciplinary scholarly field, which examines social and cultural conceptions of sound and situated within larger research on the role of each of the human senses to contribute to meaning making and knowledge construction, has recently emerged to challenge theories that have focused on the dominance of print over other literacies. Research in education and Sound Studies has, in the last few years, been charting similar waters that would, no doubt, sooner or later converge. The proposed paper will attempt to synthesize recent research in these fields and explore the function of sound in education in both present and past endeavors.

Jacques Attali says in Noise: The Political Economy of Music, argued that the west failed to understand that the world is not for beholding. It is for hearing” (Attali, 1985, p. 3). People walk around in public with portable music players and earbuds immersed in a private world of sound. According to the Generation-M study commissioned by the Kaiser Family Foundation in 2005, more than 60% of young people under the age of 18 own a portable CD player or tape player and nearly 20% have a portable MP3 player device. Young people who own and use sound media devices are exposed to cultural messages, production methods, and ideologies broadcast through headphones, cell phones, and other portable media devices in both public and private spaces.

Media Education and media literacy have looked at issues such as media effects and pedagogy about media inside and outside of classrooms. Research in the New Literacy Studies field has examined the literacies and resources beyond traditional literacies that young people use to make meaning and the varied in- and out-of-school literacy practices that help them understand the world they inhabit. A look at recent projects in critical listening and auditory production in education reveals that a synthesis of current educational research and Sound Studies (“Sonic Postcards” in the U.K. at http://sonicpostcards.org/ and “Sound Education Project” in Japan at http://sound.dmc.keio.ac.jp/) is a logical and much-needed step in helping educational researchers achieve a more complete literacy of the senses.

Formalized education in critical listening about sound and auditory media is not a new idea. An examination of the early development of nationalized educational radio programming in America in the early 1930s reveals the belief by educators and radio experts that the radio and the voice transmitted through the ether would democratize education and break down educational barriers erected by distance to create a community of listeners. The regulation of the radio in the late 1920s an early 1930s paved the way for corporate-owned, nationally broadcast educational radio programming, called Schools of the Air (SOAs). The two most prominent were run by NBC and CBS. The Music Appreciation Hour, NBC’s School of the Air, sought to foster educated listening through programming in European classical music, while the CBS show, known as The American School of the Air, implemented a curriculum that included distinguished educational programming in art, music, history, geography, and science.

An examination of the early nationalized SOAs, will show that formalized listening techniques geared towards a generalized educational audience was something that early radio programmers and educators conceived of in the early days of the radio. I examine how the programmers and educators of the early Schools of the Air broadcast on NBC and CBS tailored their techniques to foster a mass educational audience in schools and promoted listening techniques in the classroom. This examination of first national SOAs along with educational research in New Literacy Studies, Media Literacy, and Sound Studies will help to understand the place for sound as a part of educational research and practice.

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References
An Engaging Instructional Interface Through Universal Design: An Evaluation of 35 Virtual Demo Lessons in the U.S.

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The mode of virtual schooling, with its ancestors from the first U.S. correspondence program in the 1850s to courses using telecommunication technology in the 1920s (Hansen, 2001), has been developed at a stunning rate far beyond what our science fiction writers had imagined. Today’s virtual school programs can be categorized by a variety of features including commitment of time (i.e., full-time vs. supplemental), course delivery (i.e., asynchronous vs. synchronous), types of funding (i.e., public vs. private), location (i.e., school vs. home), curricula source (e.g., different course providers), and running entities (e.g., run by state vs. run by companies) according to Greenway and Vanourek (2006). By September 2008, 44 states in the U.S. had their own virtual school programs with an estimation that high school students around the U.S. will take about 500,000 to 1 million semester-credits online from 2008 to 2009, while the number of online registration was near zero a decade ago (Zucker, 2008). This radical change brings challenges to the future of curriculum and teaching including instructional strategies, assessment, and curriculum design. Furthermore, this change urges online educators to design thoughtful instructional interfaces by incorporating interactive web tools. As informed by literature, the academic effectiveness of current virtual courses doesn’t outperform their traditional counterparts (Bernard, et al., 2004; Cavanaugh, 2001; Cavanaugh, et al., 2004; and Ungerleider & Burns, 2003). Thus, based on the theoretical framework of universal design for learning (Rose & Meyers, 2006) regarding content presentation, expression, and engagement, we aim to understand “effectiveness” through the perspective of evaluating the elements of “interactivity” of the current virtual courses. We analysed the instructional interfaces of 35 demo lessons found from 96 publicly funded virtual school programs regarding web page design, content presentation, and communication and assessment tools used within them. Our evaluation shows that the majority of them lack the web 2.0 tools to support students’ participation and communication. We conclude with specific suggestions to improve the current instructional interface system through the approach of universal design to improve students’ virtual learning experience.

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An Ethnographic View of Beginning an Online Academic Journal – The Journal of Educational Technology, Media and Communications at Teachers College, Columbia University

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This work-in-progress is an ethnographic view of the beginning of an online academic journal - the Journal of Educational Technology, Media and Communications in the Communication, Computing and Technology in Education program at Teachers College, Columbia University. It investigates which free web-based collaborative work environment is best-suited to facilitate collaboration and sharing for an online academic journal. These environments are tested for the process of editing academic papers for the first issue of the journal.

Introduction

A confluence of factors is creating an environment that is contributing to an increase in the use of online academic journals over more traditional offline paper-based ones. One factor is the fixed cost of print versions of offline academic journals that is becoming increasingly prohibitive in an era of tight post-secondary education budgets. Another is the proliferation of online collaborative work environments that facilitate the type of editing process necessary to produce a high quality journal that were simply not available in the past. Other factors include worldwide instantaneous access, ease of distribution through online libraries and other information depositories, the ability to share multimedia files as well as environmental friendliness.

Research Question

This work-in-progress is an ethnographic view of the beginning of an online academic journal - the Journal of Educational Technology, Media and Communications in the Communication, Computing and Technology in Education program at Teachers College, Columbia University. One issue examined includes the following research question - which free web-based collaborative work environment is best-suited to facilitate collaboration and sharing for an online academic journal? The preliminary environments evaluated include GoogleDocs, Moodle and Wikispaces. The research setting is a practical one. These online collaborative work environments are being tested for use within the context of editing academic papers for the first issue of this new online academic journal.

Assessment Criteria

To answer this research question, a number of criteria are used to assess and compare various online collaborative work environments. These are important considerations when using these tools for a purpose such as creating an online academic journal.

From the perspective of administrators, these criteria include ease of use in creating accounts and inviting other academics to join in the editing process, the file structure organization for uploading and managing files, as well as help functions to assist in problem solving while using the collaborative work environment.

From the perspective of users who use the collaborative work environment, these considerations include interface layout, general functionality (e.g. “user friendliness”), the ability to edit a personal profile if

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available, the ability to invite others to use/access additional documents, further document set up separate from the initial administrator set up (e.g. uploading additional copies/versions of the document, uploading additional data sets and other types of data like audio, video, multimedia, etc.), the ability to edit the document (ability of/limits to individual editing versus editing in pairs versus editing in larger groups, synchronous versus asynchronous editing, the track changes mode, tracking versions, organizing files (e.g. file structure), security (degree to which access to documents can be secured), help functions (e.g. introductory tutorials, online help, phone help, etc.) as well as setting schedules and deadlines for group editing.

The research team kept diaries as well filled out summative assessments describing their experiences with the respective online collaborative work environments.
Implication for Math Game Design Through Mobile Applications: An Evaluation of 30 Online Math Games

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Today’s students have been exposed to new technologies, such as mobile phones and video games, at an unprecedented speed compared with their last generation. Simultaneously heated debates are around the lack of educational value of commercial video games and the capacity of educational video games to address subject area learning and the joy of gaming. In order to understand the status of “effectiveness” of current online video games and how the current educational games as new learning environments support students’ self directed learning, we evaluated 30 online games in the area of mathematics based on Perkins’ (1991) approach to constructivist design and Rose and Meyers (2006) universal design for learning: Perkins (1991) proposes five facets of a learning environment, while Meyers’ (2006) universal design for learning includes content presentation, expression, and engagement into the process of design. Our findings present that the majority of games are drill oriented without rich and deep context as well as lack of thoughtful structures of constructivist design. We propose possible genres for an effective educational game in mathematics, which can also be implemented as mobile applications to enhance students’ learning experience. We conclude with a prototype of mathematical game design through a combined approach of universal and constructivist design.

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The Kid Stays in the Picture?: Practical, Moral and Epistemological Issues in Field-Based Digital Ethnography

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This presentation will discuss some of the practical, moral and epistemological issues associated with field-based digital ethnography within the context of a personal documentary created by the researcher. The documentary “Home” focuses on the story of Victor Sossi, a European immigrant who has lived in North America for several decades. The subject’s nephew traveled to Europe to try to figure out why his beloved uncle has never returned home.

Introduction

The mass penetration of low-cost, broadcast-quality, digital video equipment has not only begun to democratize television broadcasting and the motion picture industry but also opened up exciting opportunities for qualitative academic research. This presentation will discuss some of the practical, moral and epistemological issues associated with field-based digital ethnography within the context of a personal documentary created by the researcher. The documentary “Home” focuses on the story of Victor Sossi, a European immigrant who has lived in North America for several decades. The subject’s nephew traveled to Europe to try to figure out why his beloved uncle has never returned. The documentary focuses on the tension between a younger generation’s need for self-discovery and an older generation’s wish to move on. Shot throughout Europe and North America, “Home” explores issues of personal identity, memory and collective grief. The video has screened in film festivals in New York, Los Angeles as well as at the Faculty of Education at the University of Cambridge, United Kingdom.

On an academic level, the presentation will discuss the history of traditional ethnographies. A more traditional definition of ethnography is contrasted with the emerging field of digital ethnography. Digital ethnography uses technologies such as video cameras, audio recorders, still cameras, computer-based editing and interactive internet technologies, etc., to collect, code, and output data in a variety of forms. The presentation discusses a number of the ways that digital technology can assist along the entire process of ethnographic research – before, during and after the research occurs, making the process conducted more efficient, comprehensive and accurate.

There is also a discussion of the moral and epistemological issues involving digital ethnography. On a professional level, the discussion will also include anecdotes from the researcher’s experiences as a professional television producer/videographer, radio host and print newspaper reporter. Practical issues involving digital ethnography will also be discussed.

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Kids Design Online

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*Kids Design Online* seeks to help children who lack website creation skills. Fulfilling the need for age-appropriate resources necessary for web design is addressed by this eight-part online tutorial which can be used in and out of the classroom. The tutorial is narrated by a member of the target audience. Consistent with constructionist theory, the children learn by doing and the deliverable that is produced is unique to their own preferences.

**Overview**

Website creation is a critical skill that is necessary in the ever-changing technological world. Elementary-age children need education and experience in science, technology, engineering, and mathematics (STEM) and literacy in a technological environment. This proposal exposes children to fundamental website creation technology. Also, teachers need age-appropriate resources for training children on website creation technology. Kids Design Online, a simple child-friendly tutorial addresses this gap by providing a key resource for teachers of elementary-age children.

Kids Design Online is devised to introduce children to website design. Children create their own basic website with Google’s new free visual site-builder, Google Sites. This is a powerful tool which is suitable even for young children. It offers attractive templates and a library of “gadgets” which make creating a website simple. This offers children technological empowerment in a cutting-edge real world medium. Kids Design Online creates an online tutorial that can be used by teachers in a classroom setting, by home-schooled children, or by others in informal learning settings to facilitate the learning of basic website creation skills. With this tool, children who read English at a third grade level and whom are proficient at using an internet web browser will be able to create and publish a website which incorporates at least one picture, two paragraphs of text, one link to another URL, one announcement, and one Google gadget from a pre-approved list.

This proposal parallels the research that deals with learning and the development of elementary-age children. According to Erikson (Slavin, 2006, pp. 47-50), third grade students fall in the middle of his “industry vs. inferiority” stage, where children begin to value the opinions of their peers more and those of their parents less. Creating public artifacts to show off can yield a sense of “industry” for the child. Children in this stage enjoy creating things and doing so successfully helps to foster good self-efficacy. Successfully creating a website would provide the student with a sense of industry.

The theoretical underpinning of this work aligns with the learning theories outlined by Jean Piaget and Seymour Papert. The heart of Piaget’s constructivism is that students learn by making knowledge their own. He noted that children see the world differently from adults and as such they learn differently than adults. According to Piaget, children between the ages of 7 and 11 learn to think abstractly and are able to begin making rational judgments about observable phenomena (Slavin, 2006, p. 38-39). Both skills are necessary for website creation. Papert defined his theory of *constructionism* as sharing “constructivism’s connotation to learning as building knowledge structures irrespective of the circumstances of learning” (Papert, 1991, p. 1). One of the hallmarks of this theoretical work is that learning takes place through the creation of a public entity. “A key aspect in knowledge construction is appropriation – how learners make knowledge their own and begin to identify with it” (Kafai, 2006, p. 39). Whereas Piaget saw sophistication as moving from concrete to the abstract, Papert equated the two, often valuing the concrete more. Objects play a central role in helping learners connect prior mental entities to new ones.

It can be argued that a website is both abstract and concrete. In a lesson where the goal is for the learner to create a website, there is nothing more concrete than having the learner create their own website. At the same time a website is little more than an abstract representation of shared ideas. A website is also a public entity, a contribution to society. Having the learner create his or her own concrete, public website not only more easily facilitates connections between new and old mental entities, it also can help others make knowledge their own.

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The primary media created was an eight-part online tutorial. The tutorial was created using Camtasia software. Consistent with constructivist and constructionist theory, the children learn by doing and the deliverable that the children produce in this lesson is their own website. A fourth grade girl was used to guide the student through the tutorial because of the proven effectiveness of peer modeling for social learning (Bransford, Brown, & Cocking, 2000, p. 80).

While jumping right into building a real website might be intimidating for some children (and even some adults), the steps in this tutorial are easy to follow and intentionally follow a top-down processing model, teaching the basic skills as we go. A top-down teaching methodology gives students a complex, complete, authentic task. It begins with a real-world problem and helps students figure out how to do each operation (Slavin, 2006, p. 245). This is advantageous for many reasons. First, it keeps motivation high since students do not need to sit through lengthy instruction before they begin meaningful, rewarding work. Second, this makes for more efficient contextual learning, since students are learning everything just-in-time as needed in the design process. Third, this offers a more transferable learning experience since students are approaching the problem just as a designer approaches it, working in a real-world “production” environment, and being faced with real choices requiring thoughtful interaction. Finally, by placing the tutorial on video, and breaking it up into eight steps, you can stop, rewind, and replay each video as necessary. The footage is reasonably paced allowing students time to follow and time to pause if necessary. The tutorial can be accessed at: http://sites.google.com/site/kidsdesignonline/home.

References
**Lit: A Mobile Game Intervention for Nicotine Smokers**

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The mobile game Lit is an intervention for smoking behavior based on self-administered behavioral coping strategies and breath therapy research. Lit uses breath control as its central game mechanism and serves as an emotional and physiological self-regulation tool to help smokers reduce their smoking habits. We are proposing an experimental study that will inform the design, development and evaluation of Lit as an intervention for reducing smoking habits.

**Theoretical Framework**

Although tobacco use may have decreased, it is still the leading cause of death in the United States (Robert Wood Johnson Foundation, 2009). Among adult smokers, 70% report that they want to quit completely, and more than 40% try to quit each year (World Health Organization, 2008). However, studies show that regardless of many available interventions, several smokers still struggle with quitting or reducing their smoking habits [Lancaster, Stead, Silagy & Sowden, 2000]; thus, the necessity of new approaches to this problem is evident.

The proposed presentation takes as its foundation that mobile games may be especially well suited to address the maintenance of non-smoking behaviors and thus can be placed in the “health-related games” domain. In a separate submission for a poster presentation, design elements for such games are discussed. Here, we propose to present a mobile game. Lit, as an intervention for smoking reduction and discuss why a mobile platform is especially suited for health-related outcomes in this area. Lit is designed to mimic the emotional and physiological effects of smoking by using the innovative game element of breath control alongside color and sound—a unique design innovation for mobile game platforms, where breath controls is not found as an input mechanism.

Biofeedback mechanisms on mobile platforms pose special challenges, but can result in the necessary “just in time” interventions that can address craving as they occur. Such use would be impossible with non-mobile platforms, as cravings can occur anywhere, anytime. The challenge, therefore, is to provide a means to intervene with a game/intervention whenever it occurs, and in ways that make a behaviorally important difference.

In a study accompanying the game’s implementation, using biofeedback measurements such as electroencephalography (EEG) techniques, physiological responses to different game events will be measured. These responses will be mapped into the circumplex model of affect (Russell, 1980), which represents emotions with two dimensions of arousal and valence.

The study will be completed by the conference date; the design of the game is completed at present. While we do not address design elements in this proposal, choosing instead to focus on the mobile platform itself as important to our behavior intervention and outcomes, members of the audience will leave the session with a better understanding of why certain outcomes, and input mechanisms, appear on a continuum that must be considered when making decisions about the type of platform (e.g., mobile or fixed, multiplayer or single user, and so on) should be chosen in conjunction with health-related and/or behavioral outcomes.

Within the mobile platform, we will discuss the possibility of utilizing breath control as a game element to provide players with an effective coping strategy that allows them to reduce smoking behavior. Breath therapy has been proven to be an effective intervention for reducing smoking [O’Connell, Hossein, Shwartz & Leibowitz, 2007]. Deep inhalation during smoking promotes relaxation. Breath therapy interventions for

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smoking cessation focus on guiding smokers in regulating their breath mechanism in a way that slows down the pace of their whole body and therefore promotes general relaxation (American Lung Association, 2009). The breath interface allows greater scope for biofeedback effects and has been shown to be an effective intervention for smokers in other contexts since it mimics the physical behavior of smoking (O’Connell et al., 2007).

Lit is being developed and will be distributed for a smart-phone environment. Mobile platforms allow players easy, everyday access to the harm-reduction intervention.

Moreover, the mobile nature of the platform lets the game occur in the context where players would ordinarily smoke—outside and/or during brief breaks in their daily schedule. By delivering the intervention in the same place as the behavior that players want to change, we expect increased effectiveness from the game (Godden & Baddeley, 1975).

**Research Questions and Hypotheses**

The research questions that will be addressed in this study are as follows:

Q1: Is using biofeedback measurements a helpful design technique for developing mobile games for self-regulated health interventions? Specifically, is this technique useful for developing a game for smoking reduction?

Q2: Is breath control a useful game element in games for health interventions? Specifically, does breath control as a game element provide players with an effective coping strategy that allows them to reduce smoking behavior?

The hypotheses are:

H1: Lit’s Rush mode will evoke physiological reactions in the player comparable to nicotine’s stimulant effect.

H2: Lit’s Relax mode will evoke physiological reactions in the player comparable to nicotine’s sedative effect.

H3: Lit will reduce smoking more than breath therapy alone among smokers who are trying to quit.

H4: Smokers who use Lit with the breath control interface will reduce their smoking more than those who use a version without breath control.

**Measurements**

To validate these hypotheses, biofeedback of smoking and of specific game-play events will be measured and compared. The mean physiological value during game-play with and without the breathing component will also be measured. To assess whether Lit is effective at reducing smoking, a randomized controlled experiment with one control group and two experimental groups will be conducted. A pool of 120 subjects in their 20s and 30s who wish to reduce their smoking habits will be divided into 3 groups of 40 subjects each.

The control group will use breath therapy as an intervention to reduce smoking. Subjects in the first and second experimental groups will play Lit with and without the breathing component respectively. The experimental groups will be provided with iPod touch devices with the appropriate version of Lit. Subjects’ level of smoking activity will be tracked using a saliva-based Cotinine test (Jannone and O’Connell 2007). Subjects will also use a self-report survey application installed on their iPod touch to report their smoking activity and game use.

**Implications**

We believe that Lit will promote the use of underutilized game mechanism of breath control, which could open a new set of opportunities for game designers in designing games in the future, contributing to health issues, research and education. These and other aspects of mobile platforms as a delivery system for on demand health-related games form the core of the proposed presentation.

**References**


A New Culture: Digital Immigrants Teaching Digital Natives

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This article discusses digital natives as a new culture and how culturally responsive learning and Carol Lee's (2007) Cultural Modeling can be used to address the learning needs of this emerging population of students. The techniques used in culturally responsive learning are explored and then applied to teaching digital native students including the use of cultural data sets, the importance of community, cultural mismatch theory, multi-party overlapping, pattern recognition, revoicing, transfer, leveraging, and scaffolding.

Reference

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Promoting Development of Youth’s Leadership Skills in Virtual Worlds

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Videogames and online multiplayer game worlds have been documented to be the sites of “naturally occurring, intrinsically motivated learning” (Squire, 2006, p. 22; Gee, 2003; Steinkuhler, 2007). Embedding a culture of learning is a key goal for many models of education, applying from the early years (Carr, 2001) throughout at least all years of employment (Leitch, 2006). Researchers have been listing leadership skills as a skill can be learned and improved through participatory communities in multi-user virtual environments. Yee (2006) concluded that personal advancement in MMORPGs typically involves collaboration among groups of users in an attempt to achieve a challenging task. Thus, a prime candidate for acquired skills is leadership skills. However, in virtual worlds such as TSL or Whyville, there are no pre-set goals for teens to create communities for achievement.

Leadership development has been and continues to be a major goal of most youth programs. Miller (1976, p. 2) defined youth leadership life skills development as self-assessed and organization-specific “development of life skills necessary to perform leadership functions in real life.” Level and degree of participation is a factor to consider in the development of leadership life skills. In their study, Heinsohn and Cantrell (1986) found that the greatest impact on leadership life skill development would be made by increasing youth involvement in leadership experiences beyond the community club level.

Other variables have been shown to have a relationship with youth leadership life skills development. Included are achievement expectancy (Dormody & Seevers, 1993) self-esteem (Blackwell, 1990), years in the youth program (Miller, 1987; Orr & Gobeli, 1986), age (Boyd, et al., 1993), ethnicity (Blackwell, 1990; Dormody &Seevers, 1993), gender (Orr & Gobeli, 1986), and place of residence (Heinsohn & Cantrell, 1986).

While all these variables can be evaluated and controlled, an important question remains when studying the development of leadership skills in virtual environments: Will teens be able to transfer the leadership skills they learned in virtual environments into their daily life?

One of the projects seeking to find answer to this question is Dream It. Do It. Initiative (D.I.D.I.). D.I.D.I. is an 18-month project launched in September 2007 as a partnership between Ashoka’s Youth Venture (genV.net) and Global Kids, a non-profit organization based New York City (globalkids.org). It engages teens to create and lead their own sustainable ventures that address issues of health through Teen Second Life (TSL) which is the version of Second Life for youth ages 13-17.

The D.I.D.I process consists of five main steps: workshops, developing venture, selection panel, venture launch, building the movement.

In D.I.D.I. workshops, youth identify health-related problems in their community (local, virtual or international) and brainstorm ideas to tackle the problems using their skills and interests. Then, they form teams and develop detailed action plans for their venture projects. The next step for teams is to present their ideas to a selection panel of peers and adults who determine whether the team’s venture is ready to launch. When teams are ready to launch, D.I.D.I. provides: 1) seed funding (up to US $1,000 per team), 2) ongoing tools and support, 3) peer Mentors to provide expertise and support, 4) a network of fellow venturers both within and outside of TSL, and 5) an identity as part of the global Youth Venture movement (GenV.net).

This process requires teens, especially team leaders, to focus on their venture ideas, to do research to be able to support and communicate their ideas, collaborate with other teens they meet in TSL, coordinate meetings with team members, organizing events to reach people who may join their team or may need help from the team. These are only a summary of what team members do during their venture process, and all of these require teens to use skills that are also real life skills such as problem solving, public speaking, communication.

Therefore, my hypothesis is that youth involved in the organization and launching their ventures will show advanced problem-solving and other knowledge age skills including communication, confidence, creativity, motivation and teamwork. The related research questions are:

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• What are the leadership skills youth learned during their experience with D.I.D.I that they transfer into their real life?
• What were the challenges teams encountered during their venture process and how did they overcome these challenges?

Data collected from teams consists of demographic information, pre-and post-surveys, action plans of all teams, interviews with several team leaders as well as a survey to find out the most common reasons for drop-outs from the program. Total of 38 teams initiated their venture process, but not all of them launched. Total of 41 teens from 22 different teams responded to the survey which asked both Likert scale questions and open ended questions to capture their experiences and change in their mindset about leadership and initiative such as the change in their view towards issues in their neighborhood/nation, their skills gains when participated in D.I.D.I Initiative, how getting involved with D.I.D.I has changed their confidence in being able to make a change in their community.

Initial analysis of survey data shows increased enthusiasm of youth for their ventures during the process; 23 teens said they became a lot more enthusiastic during the process of running their venture while 13 said they became a little more enthusiastic. This indicates increased self-motivation which leads increased involvement and learning (Deci and Ryan, 1985). Ninety percent of teens think that they became a better leader with their involvement with D.I.D.I, and they reported the program helped them increase their communication skills, organization skills as well as by changing their concept of community through introducing ideas about reaching others through a virtual world.

Wenger (1998) contends that learners need “places of engagement” and “ways of having an effect on the world and making their actions matter.” (p. 271). Virtual worlds like TSL can be used by leadership development organizations as a “place of engagement,” where teens can meet with their peers through formal and informal learning activities to learn and increase their leadership skills.

References
Reading “Lucy Through the Wardrobe” from Novel to YouTube Fanvideo: Tween Franchises and Cross-Media Literacies in the Primary Classroom

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Contemporary books aimed at preadolescent readers are increasingly part of multi-media ‘tween’ franchises that can include film and television adaptations, music, video games, clothing, and cosmetics. Moreover, in the context of participatory fan culture, readers actively transform characters and narratives in often revolutionary ways through fan websites, fan-produced videos and texts. The recent film adaptation of C.S. Lewis’s The Chronicles of Narnia: The Lion, the Witch, and the Wardrobe (2005) exemplifies cross-media production and consumption trends in contemporary children’s book publishing. Using the Narnia protagonist Lucy Pevensie as a key example, this presentation highlights how textual meanings from classic children’s literature are negotiated and translated across media by producers and reader/viewers. Moreover, I will reveal how digital media offers opportunities for young readers to actively engage with the discourses of literary texts. Rooted in my doctoral research about the cross-media literacies of preadolescent readers, the presentation will identify the potential use of cross-media phenomena in the development of literacy curricula and critical pedagogy in elementary schools.

This presentation will examine the representations of Lucy in Lewis’ original edition of The Lion, the Witch and the Wardrobe (1950), the BBC television adaptation (1988-89), the animated adaptation (1979), the recent Disney/Walden Media feature film (2005), the official website for the film, fan-produced websites, and other associated merchandise. I will discuss a selection of fanvideos and fan fiction, as well as online fansites dedicated to Georgie Henley, the actress who plays Lucy in the recent film. In addition, I will discuss how eight and nine-year old participants engaged with these cross-media texts during focus group discussions in London (UK) and Toronto (Canada).

References

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Reading Subjects in Digital Ashes: An Inquiry into Narrative Constructions of Subjectivity on YouTube

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Seeking an appropriate use of public hypertexts in the classroom, the author investigates two YouTube sites representing the attacks of September 11, 2001. This inquiry utilizes positioning analysis and a theory of subjectivity based on the work of Judith Butler to explore the formation of subject positions within YouTube clips and text comments. The author argues that YouTube sites can be invaluable tools for exploring the emergence of competing histories and the individual subject positions necessary to sustain these histories.

General Notes

YouTube invokes the use of new forms of literacy practices and marks novel processes in the formation of subjectivity that remain largely unexplored in academic literature. While individuals use YouTube in countless ways to do countless things, one particular use serves as the object of this analysis: that is, the use of YouTube to catalogue and represent historical events. Utilizing a single event (the attacks of September 11, 2001) the author examines popular and political figures discussing the attacks as well as text responses to these clips. The paper thus addresses two questions. First, how do political and popular figures, as appearing in YouTube sites, construct subject positions in relation to historical events? Second, how do participants on these sites utilize and subvert these subject positions in relation to these figures and in relation to fellow participants through the use of text comments?

Judith Butler’s (1997; 2005) work on subjectivity allows one to conceive of the subject as “the linguistic occasion of the individual to achieve and reproduce intelligibility, the linguistic condition of its existence and agency” (Butler, 1997, p. 11). Utilizing Butler’s analytic, interpretive frame the author interprets YouTube participants’ processes of actively constructing narrative selves in relation to and within various layers of hypertextuality contained in YouTube.

This inquiry suggests that categorical markers utilized by popular and political figures in 9/11 YouTube clips drew on conflicting bifurcated histories of the United States. Further, text comments reflected these dichotomous categories and asserted subject positions for both text authors and interlocutors in ways that connected self and others to two competing versions of American history. Finally, the scope of these subject positions tended to become more widely encompassing as text threads developed and exchanges became more and more heated. One does not need to assume that these practices directly represent or generate views of the attacks of 9/11 or of U.S. foreign policy in general. Rather, this inquiry is concerned with the mechanisms through which individuals actively perform and subvert particular subjectivities in these hypertexts. One might conceive of user/participants as interpellating (Althusser, 1971/2006) co-participants into competing or collaborative positions in ways that construct dichotomous (and often times racially charged) depictions of the United States in relation to 9/11.

This study implies the need for approaches to media literacy that meet the shifting needs of participants in Web 2.0 spaces. These literacies do not involve determining the ‘truth’ or the ‘accuracy’ of historical representations but instead require an excavation of the assumptions upon which various representations rest. While YouTube falls short as a means of presenting historical ‘truths,’ it is a powerful tool for exploring the ways subjectivities are constructed in relation to particular historical events. The purpose of this research is to utilize YouTube in such a way and to perform literacy practices that can be utilized by students and teachers alike.

References

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Reflective Adaptability of Chinese and American Students in a Mathematics Video Game

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This study proposes Chinese elementary students have stronger ability in solving novel mathematics problems than the American peers as a consequence of receiving more effective classroom instructions. An experiment was conducted to compare how students in the two countries improved their problem-solving efficiency in a mathematics video game, with the prediction that Chinese students adapted faster to the novel problem than American students.

Substantive research has been conducted in comparing students’ mathematical performance in China and America, with the consensus that Chinese students are outperforming American students on various tasks such as base-ten counting and place values, calculation and mental math, simple and process-constrained problem solving, and flexible math representation (see Wang and Lin, 2005). The difference of students’ mathematical performance between the two countries is attributed to the mixed influence of maturation, educational systems, schooling, culture, and language (Cai, 1995; Geary, Bow-Thomas, Liu, & Siegler, 1996).

Among the various factors, teachers’ classroom practice has been frequently explored, with the conclusion that Chinese teachers usually offer more effective instructions in terms of frequency, quantity, depth, level, and comprehensiveness than American teachers (e.g. Ma, 1999; Perry, 2000; Wang and Lin, 2005). For instance, Ma (1999) observed that Chinese teachers tended to teach subtraction with regrouping and multi-digit multiplication from a conceptual perspective so that the taught procedures may be transferred more easily to other problem-solving scenarios, whereas American teachers tended to teach from a procedural perspective which was poorly transferable. Ma’s point of view is paralleled by the findings of the TIMSS 1999 video study series comparing mathematics teaching and learning in 20 countries that mathematics teaching in the U.S. had reinforced attention to low-level mathematics skills, and American students show weaknesses in higher-level mathematics thinking skills compared to high-achieving countries such as Japan and China (Hong Kong) (Hiebert, Stigler, Jacobs, Givvin, Garnier, Smith, Hollingsworth, Manaster, Wearne, and Gallimore, 2005; Tatsuoka, Corter, and Tatsuoka, 2004).

From a cognitive viewpoint, due to the lack of higher-level thinking skills, American students should therefore have weaker mathematical understanding compared to the Chinese peers, and have difficulty in choosing and applying strategies efficiently in solving complex or open-process problems that require higher-order thinking, whereas they may or may not underperform in lower-level mathematical skills. Interestingly, existing evidence from comparative cognitive studies seem to lead to the opposite conclusion. For example, Chinese students outperformed American students in computational, process-constrained, and simple problem-solving tasks, but not in complex or open-process problem-solving tasks. In addition, the strategies employed and the errors made by Chinese students during complex problem solving are identical to those of American students (Cai, 1995, 2000; Cai & Silver, 1995).

To investigate this controversy, researchers such as Wang and Lin (2005) suggest focusing on the interactions between classroom teaching and other educational factors such as social-cultural influences. The authors of this paper, however, attempt to explore this issue from the cognitive development perspective. We propose that by receiving more effective classroom instructions, Chinese students don’t necessarily have high proficiency in solving all types of problems, but instead develop the reflective adaptability necessary towards solving novel problem. In other words, Chinese students can consciously analyze aspects of a novel problem as the reference to evaluate their problem-solving processes based on the classroom instructions they

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receive, and develop the most efficient solution faster than American students. The concept of reflective adaptability, borrowed from Lin (2001), refers to the ability of an individual to explicitly choose aspects of a novel problem for adaptation and evaluate their problem-solving processes.

The researchers employed video game as the instrument for this study as it conforms more closely to the reflective adaptive learning paradigm compared to the traditional paper-and-pencil instrument. Because during self-directed learning in the gaming environment, students are likely to be motivated and mentally engaged so as to think actively during problem solving (see Jonassen, Carr, & Yueh, 1998; Rieber, 1996).

The authors intend to investigate whether Chinese students have higher reflective adaptability than American students in solving novel mathematical problems. The research questions include:

1. How do Chinese and American students differ in terms of problem-solving accuracy, speed, error, and strategy-use when encountering novel mathematical problems?
2. How do Chinese and American students differ in the process of improving problem-solving accuracy, speed, errors, and strategy-use while they practice solving the same mathematical problems repeatedly?

To answer these questions, the researchers conducted a study to compare U.S. (n = 30, mean age = 11.21) and Chinese (n = 10, mean age = 10.22) elementary students’ performance in a math-related computer game called Mat-Matics, where students solved addition problems by pressing buttons with their feet on a dancepad. The game presented a novel problem to the students by requiring them to use eight buttons (+1, +5, +10, -1, -5, -10, ENTER, and CLEAR) to construct and enter answers in the game. Each student played the game fifteen times within three weeks. The play data were collected automatically by the game including all game settings, button presses, as well as questions, accuracy, and time spent on each problem-solving trial.

The data analysis of this study is currently under progress. The researchers will employ the Differentiation and Integration (DAI) Theory proposed in Siegler and Chen (2008) as the guiding principle to analyze cognitive change during the experiment. The rationale of adopting the DAI theory is that cognitive change is a prolonged, complex process that may undergo a fluctuating rather than linear learning curve. Therefore only by nuanced analyses on the rules that students used trial by trial can the researchers understand students’ cognitive change accurately. The researchers will examine and compare the button presses and button-press clusters (e.g. +10-1-1 representing +8) by Chinese and American students, in addition to their accuracy, time, and errors.

The predictions are that although Chinese students may not possess advantages in problem-solving efficiency or strategy use compared to American students when they first encountered the novel mathematics problems, they adapted to the problem-solving faster, improved strategies more efficiently, and reached problem-solving automatically sooner than American students. Results will be discussed with implications and future research for reflective adaptability regarding the difference of mathematical competence of Chinese and American students.

References


Robotics as a Tool for Embodying Elementary Mathematics

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In this paper, we discuss the design of a 6-8 week upper elementary school curriculum that focuses on the development of several mathematical skills in the context of robotics problem-solving using Lego Mindstorms NXT. Two forms of instruction were implemented to test a hypothesis that directing students to simulate robot movements and estimate values would facilitate greater understanding and transfer than more precise, mathematical strategies. Results of interviews, given during a problem-solving task, are discussed briefly.

Background

Mathematics is not only an abstract symbol system, but a means for understanding and manipulating our world. Yet developing units of study that are both relevant and motivating can be a challenge for the mathematics educator. Word problems and discovery scenarios can be constructed to demonstrate a single mathematical principle, but then are soon forgotten once the principle is abstracted. Yet, recent theory and evidence suggests that even abstract principles are understood through their connection to perceptual and motor experiences in the given domain (Barsalou, 1999; Glenberg, Gutierrez, Levin, Japuntich, & Kaschak, 2004). From this perspective, robotics provides rich experiences with a diverse set of mathematical principles as a means for creative expression, problem-solving, and conceptual understanding.

Although robotics can be used to incorporate an almost unlimited range of mathematics, of critical importance is to focus on concepts that have as much relevance outside the context of robotics as within it. Recent evidence suggests that imprecise, estimation abilities play a major role in a wide range of mathematical competencies (Halberda, Mazzocco, & Feigenson, 2008; Opfer & Siegler, 2007). In one study researchers found that the estimation ability of 14-year-olds was correlated with several years of these students’ standardized mathematics scores (Halberda et al., 2008). We suspect that these correlations may be, in part, mediated by the students’ fluency with constructing mental representations from mathematical stimuli. In other words, those students who are able to accurately estimate a given quantity are more able to imagine this, or any other, quantity when problem-solving; thereby providing a basis for higher-level mathematical reasoning. Our curriculum, therefore, attempts to enhance student conceptual understanding by focusing on estimation of several quantities relevant in robotics and providing opportunities to apply these skills in authentic and motivating problem-solving scenarios.

Robotics Curriculum

Given the importance of developing a child’s number sense, our curriculum focuses on two mathematical systems where estimation is critical: (i) arithmetic with fractional numbers - represented in decimal form and (ii) measurement of rotation - represented in degrees. Both concepts are necessary when programming the robot’s motion path. Fractional units are frequently applied to increase the precision of movements, while rotations are applied to turn the robot. These mathematical concepts are also necessary in Logo programming. Conceptual understanding of rotation, in particular, has been the target of prior studies using Logo, and appears to be sensitive to students’ experience using such technology (Clements & Battista, 2001). However, Lego Robots introduces an additional level of complexity because standard units of measurement (e.g. centimeters, degrees) must be converted into a single unit of measure: rotations of the wheel. This unit of measure is dependent upon the circumference of the tire, such that one-half rotation of the standard tire turns the robot approximately 90 degrees. This distinction between what the robot is doing and what the wheel is doing provides both a source of confusion and several teachable concepts.

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To explore the relationship between estimation ability and problem-solving, two forms of instruction were developed. In the first form of instruction, students embody the concepts described above by simulating the movements of the robot with their own bodies. Prior to engaging in a problem-solving task, students are provided with a set of exercises in which they are asked to move forwards (e.g. 5.7 tire rotations) or turn (e.g. 45 degrees right) a given amount. In the second form of instruction, students make precise measurements and calculations using standard tools and algorithms. Like the embodied group, this group receives a series of exercises prior to problem-solving activities. Rather than simulate these actions with their body, the students draw or measure forward movements and rotations with a standardized number line or protractor, respectively. These students calculate the conversion from standard units to robot units by applying arithmetic strategies. Because the former strategy requires students to construct embodied representations of numbers, which, by its nature, utilizes imprecise estimation, we suspect that this form of instruction should allow for greater gains in estimation ability. In turn this may reduce cognitive load (Sweller, 1988) and facilitate some forms of higher problem-solving. However, the use of tools and precise calculation strategies may facilitate the completion of more exercises in a shorter amount of time, therefore allowing more time within the problem-solving tasks.

Following the exercises, the students are asked to plan and implement a program using Lego Mindstorms programming software to meet a problem-solving challenge. In the two main tasks, called “Treasure Hunts”, students program their robot to navigate along a pattern of x’s marked along the floor, successfully touching each x. In the first task all x’s are aligned perpendicularly, such that only 90◦ rotations are necessary. The goal of this task is to estimate the lengths between the x’s given the total length of the course. To successfully accomplish this task the students need to utilize fractional numbers. In the second task, the x’s are no longer set apart at right angles, thus requiring the students to estimate the angles of rotation. Although we do not enforce use of the embodied or measurement strategy during these tasks, we do encourage struggling students to apply a learned strategy to solve the problem.

**Implementation**

Both forms of instruction were implemented with a small group of students (n = 10) at a private school in Manhattan over the course of a semester. During most classes students were split, consistently, into one of two groups in order to receive the assigned instruction and practice the exercises. The students were then reintegrated to perform the problem-solving tasks with a partner who had received the same form of instruction. To assess the knowledge of these students both pen-and-paper tests and video-taped interviews were conducted. Because of the low number of students and several key absences during testing, the interviews proved to be the most revealing.

Interviews were given after students finished their activity and intended to assess student understanding of concepts embedded within the task. For example, following the second “Treasure Hunt” students were videotaped while writing a program to guide a robot around a triangular track, given only the length of the three sides. To successfully accomplish this task the student had to draw a correctly proportioned triangle, choose the correct direction of each turn, and estimate the number of degrees in each turn. A correct response would include either three right or three left turns; however, at least once, the student would need to overlook his own orientation to provide the correct answer. Furthermore, the robot does not turn along the internal angle at a vertex of the triangle, which would be drawn inside the triangle, but rather the supplement of this angle, which would be drawn on the outside (i.e. 180 – the internal angle, see fig. 1). This means, in the case of a right triangle, the other two angles of rotation would be greater than 90 degrees. We suspected that those students who could successfully imagine the motion of the robot would be at a clear advantage in this task.

During these interviews it was clear that many of the students found the task rather difficult. Mentally transitioning between discussions of forward motions, turns, rotations of the tire, and degrees clearly required a high degree of cognitive load. Two notable exceptions, from the embodied group, arose. In one case, Student M, recognizing his own difficulty, spontaneously stood and simulated the motion of the robot. He was able to successfully recognize that all turns were in the same direction (left) and greater than 90 degrees. In the case of Student O., the same conclusion was reached by simply rotated the paper to judge the correct direction of turn. While estimating the angle this student drew a 90 degree angle as a segment outside of the triangle and compared the rotation of the robot to this landmark. Additionally, a third student from the embodied group was able to recognize that the rotations were greater than 90 degrees, although he
incorrectly estimated this as 180 degrees for all three turns. In the case of all other students, at least one incorrect direction of turn was applied and internal angles were estimated. Furthermore, in the case of the non-embodied group, additional difficulty with estimation was met and three students asked to use a protractor. One student from this group was able to use his hand to demonstrate the correct motion of the robot – including turns – yet, when asked to estimate a number, he stated, repeatedly, “I’m not sure” and simply guessed, “50.” Although his hand gesture demonstrated the correct turns, he was unable to transfer knowledge from the protractor to this motion.

These interviews suggest that encouraging students to simulate the motion of the robot was useful in later problem-solving. However, many students were unable to correctly solve the problem during interviews. In future implementations we plan to introduce more challenges and written tasks to encourage embodied thinking while problem-solving. Furthermore, with a larger sample size and additional assessments we aim to more clearly depict the relationship between the type of instruction, estimation ability, and problem-solving success.

Figure 1: Demonstrates the direction and the angle that needs to be recognized during the interview task. In this case a right turn for the robot is a motion to the left, from the perspective of the reader. Also, the angle of rotation is external to the motion path.

References
Runesinger: A Case Study in the Coupling of the Elements of Language to the Rules of Play

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Runesinger is a demo of a PC videogame to speak and spell Korean. The player practices a few nouns and verbs by serving food to hungry villagers in North Korea. The player sings a jingle while a ball bounces on each iconic syllable. Through a spelling puzzle, the player composes each syllable in Hangul. Subsequently, the player sings with Korean subtitles. The virtual environment and user interface embody the rules of Hangul.

Overview

The process of secondary language (L2) learning generally includes tedious exercises for at least an hour a day for several years. Therefore, improving the emotional satisfaction of the language learning exercises would improve the quality of life for millions of practitioners. Furthermore, motivation to continue using computer-assisted language learning (CALL) is a potential barrier to the software’s efficacy. Apart from the educational content, such drills have little intrinsic motivation (Hinkel 2005). This lack of motivation makes a case for a serious game. During the past decade, videogames have begun to supplement some secondary language learning. For the most part, the educational content has been out of context and the use of rules and play has been trivial.

Runesinger is a demo of a PC videogame to practice speaking and spelling Korean. This computer-assisted language learning teaches a few meaningful nouns and verbs through the task of serving food to hungry villagers during the North Korean famine of 1997.

Figure 1: The user sees a simple 3D virtual environment, rendered in OGRE (left). A ball bounces on each syllable. At first, Hangul is replaced with icons, which makes the user feel more comfortable (right).

Inspired by melodic intonation therapy (Aetna 2008), the phrases are embedded in jingles. While the user listens and sings each note, a bouncing ball synchronizes the phonemes and iconic placeholders for the graphemes (see Figure 1). The user learns a subset of 한글 (Hangul), the Korean alphabet, through a spelling puzzle (see Figure 2). Subsequently, the user sings to same language subtitling (SLS) in Hangul (Kothari 2004) (see Figure 3).

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Embodied cognitive linguists believe that in order to learn a natural language, the learner must interact with a physical environment (Feldman 2006). Although an immersive interface is beyond the scope of this project, Runesinger displays an interactive virtual environment in three dimensions (3D) (see Figure 1). On screen, iconic objects are rendered in three-dimensions, which according to a neural theory of language (NTL), enhances the neural binding of image schemas to spatial tasks and language use (Feldman 2006). The abstract representation of the characters and objects makes them easy to recreate and apply to diverse experiences.

A single English word is shown to teach each Korean word, and no English is provided for the phonetics. Except for introducing the interface and story, the user is gently immersed into the target language. While playing, the user is presented with minimal English, which would interfere with language acquisition. Animation, sound, and graphic design provide context to the learning. In small increments, new letters, syllables, and words are introduced and practiced.

The virtual environment, user interface, and story were designed explicitly for the spelling and phonetic syntax of the Korean language. Thus, a user can mentally simulate physical objects behaving under physical mechanisms that embed mnemonics of the rules for spelling and pronouncing Korean. This suggests rich possibilities for designing for other secondary languages, in which the virtual environment and user interface are tailored to that language’s unique rules for syntax and grammar.

This project began with the question: How can a student design a videogame such that, while playing, a user learns a skill transferable to an academic, business, or artistic setting? In the course of a few sessions of fifteen minutes each, Runesinger practices listening, speaking, and spelling of a few Korean words. Assessment-driven design, based on the S-TOPIK (KICE 2009), was instrumental in evolving the software to satisfy its dual criteria of language acquisition and motivation to learn.
The innovation of Runesinger is to harness the tropes of videogames for practicing a foreign language in a meaningful context. While language learning software, such as Rosetta Stone or Declan, exists, in Runesinger, the user learns through meaningful play.

References
Striving for Equity via Evolution of Language: Demographic and Technological Change for a Globalizing Japan

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In Japan, the shifts due to globalization—particularly the forces of demographic and technological change—have profound implications for language-in-education policy. Japan’s public espousal of internationalization belies the dearth of educational support that continues to marginalize linguistic minorities. At the same time, new technologies are transforming communicative practices. Through the lens of language as an evolving social construct, this paper analyzes how new technologies are refining language and empowering a bottom-up construction of knowledge.

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Teaching Historical Empathy to Develop Ethical Citizens

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An essential component of citizenship is the ability to apply ethical thinking skills, which can be supported through the practice of historical thinking and empathy skills. One potential way to develop these skills is through games with rich historical contexts. In this paper presentation, we will discuss in-depth two games—Mission America and Reliving the Revolution—and their implications for designing games to support historical empathy.

General Notes
How can we better develop democratically-engaged citizens in our globally interconnected, rapidly evolving world? One essential component of citizenship is the ability to apply critical, historical and ethical reasoning skills, which can be supported through the practice of historical thinking and empathy skills. In this presentation, I describe and compare two games that seek to enable the practice of historical empathy. I will share a framework for creating and studying these games, and provide a set of recommendations for developing future games.

Ethics is, in general, the practice of enacting choices and moral judgment to achieve the life of a good human being (Sicart, 2005). Jenkins, in the MacArthur Foundation Whitepaper, “Confronting the Challenges of Participatory Culture,” cites ethics and ethics education as a top challenge for today’s youth. He argues that there is a “breakdown of traditional forms of professional training and socialization that might prepare young people for their increasingly public roles as media makers and community participants” (Jenkins, 2006). Although young people are becoming media creators as well as consumers, they are not acquiring the appropriate ethical norms and professional practices, nor do they understand how to apply ethics, make decisions or reflect on their own ethical behavior (Jenkins, 2006). Mastering this type of thinking is essential for full participation in “public, community, creative, and economic life” (New London Group, cited in Jenkins, 2006).

Empathy is a significant component of morality and ethics, as it enables people to consider others when making critical decisions for oneself and the community. Ashby and Lee (1987) describe empathy as “an achievement: it is where we get to when we have successfully reconstructed other people’s beliefs, values, goals, and attendant feelings” (p. 63). Teaching historical empathy is one possible way to teach students how to reconstruct others’ values in diverse contexts and multicultural frames. Historical empathy furthers one’s ability to be a critical thinker and engaged citizen.

Games and simulations can be rich playgrounds for the practice of these ethical choices, as they offer the ability to iterate and reflect on multiple possibilities and consequences, and to take on different personas and identities. As such, educators and researchers are beginning to consider the use of games in supporting ethical reasoning, historical empathy and character development.

The first game we describe is Mission America: Crown or Colony?, the first of a planned series of five free online video games set in different eras in American history, including pre-Revolutionary Boston. Mission America’s development was spearheaded by Channel Thirteen/WNET, and supported by partners Electric Funstuff, American Social History Project (ASHP), Education Development Center’s Center for Children and Technology (CCT), National Council for the Social Studies (NCSS), and the American Library Association (ALA)/American Association of School Librarians (AALS). It was created as part of a grant from the Center of Public Broadcasting called the “American History and Civics Initiative.”

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In Mission America: Crown or Colony?, students navigate historic settings, meet key figures, investigate primary documents, witness pivotal events such as the Boston Massacre, and ultimately decide their character's fate. The game promotes students' historical understanding through interacting with both the game and classroom materials that foster historical thinking skills, including using evidence to form historical interpretations; understanding the causes and effects of events; identifying turning points when past decisions and actions have affected the future; and detecting patterns of change and continuity over time. For example, in one part of the game, students witness a portion of the Boston Massacre, and need to provide a deposition based on their account, explore the motivations of the characters involved, and consider alternative possibilities to what happened. By giving students the opportunity to develop their historical empathy skills, Mission America encourages them to think more deeply about the choices and challenges faced in the past.

Similarly, Reliving the Revolution (RtR), is an augmented reality game that encourages students to consider multiple versions of history and to empathize with a historically-grounded identity. Augmented reality (AR) games are gaming environments that embed virtual, location-specific and contextual information into a physical site. These games require mobile or ubiquitous computing devices, such as handheld computers or cellular phones, to enable game participants to access this virtual information.

RtR takes place in Lexington, Massachusetts, the site of the Battle of Lexington of the American Revolution. The goal of the game is for participants to “relive” the events of April 19, 1775, and decide who they think fired the first shot at the Battle of Lexington, which remains a mystery today. To do this, game participants explore the present-day Lexington Common and inspect the physical buildings and structures that were involved in the Battle of Lexington. They also use a GPS-enabled personal digital assistant (PDA) to help navigate the physical environment and access and store virtual information pre-programmed to appear at specific GPS coordinates. Participants can (a) “talk” to a historic figure such as Paul Revere or Captain John Parker (these are called non-playing characters or NPCs); and (b) inspect a game item or real building (such as a musket or Buckman Tavern). For example, when a participant gets closer to the Old Belfry, a photo and description of the item is triggered to appear on the PDA. The participant can then read his version of the events at Lexington, which appears in the form of a concise written testimonial. NPCs will often also provide to the participant a graphical document or image, which are typically copies or recreations of actual documents from the Revolutionary War period, such as diary entries, letters, newspaper articles, maps or sketches; or photographic images of physical buildings and signs around Lexington.

The participants play the game in pairs and in one of four roles, based on actual historic figures from the Revolutionary War period: Prince Estabrook (African-American slave/Minuteman soldier); John Robbins (free/Minuteman soldier); Ann Hulton (Loyalist/townsperson); or Philip Howe (Regular (British) soldier). Participant pairs gather and analyze the historical information as these roles, and then collectively deliberate who they think fired the first shot based on their differing evidence.

Mission America was tested in two public New York City middle schools with three teachers and 123 seventh-grade students. Research found that the game and materials supported the project's learning objectives, including improving historical thinking, and enhancing skills such as "speculating about motives and bias, justifying opinions with reasons and evidence, and evaluating historical accounts" (Mission America Proposal). We also found that teachers adopted the game into their regular teaching practices differently, contributing to different experiences and classroom discourse about the historical content. Likewise, RtR was tested with three separate groups of students; the first two consisted of college and post-graduate school students, the third consisted of local middle and high school students. Participants were able to manage and navigate vast amounts of data, fluidly analyze and communicate among multiple modes of media, apply visual analyses to images and objects, try out various leadership and collaborative styles, identify biases in evidence, refute others’ claims using found data, reflect on one’s learning process, construct one’s own narratives and hypotheses, adapt, play, and experiment. In both games, students were also emotionally engaged and able to identify with characters and contexts, and consider alternative perspectives, all of which support their historical empathy abilities.

Results of qualitative tests of both games will be discussed in detail, as well as the extent to which their designs supported historical empathy and ethical reasoning skills. Based on the results and analyses of these two game case studies, we will recommend new and creative ways to teach ethics and incorporate empathy skills into history education.
References
Technology, Identity, and Commitment: The Role of the Internet in South Asian American Women’s Ethnic Identity Development

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Developmental psychologists refer to an individual’s relationship with his or her racial or ethnic group as “ethnic identity.” More specifically, William D. Wakefield and Cynthia Hudley define it as “the sense of belonging that an adolescent feels toward a racial or ethnic group as well as the significance and qualitative meaning that the adolescent assigns to that group membership” (2007, 148). Ethnic identity development occurs through the processes of exploration, or investigating one’s ethnic identity, and commitment, or visibly displaying one’s connection to one’s ethnic identity (Phinney & Ong 2007; Wakefield & Hudley 2007). Numerous studies confirm that immigrant adolescents with the highest academic achievement, most positive relationships with peers and adults, and healthiest self-images tended to have “strong” ethnic identities, as determined through standardized measures, and as evidenced by individual’s engagement in exploration and commitment (Phinney, 1990; Qin, 2006; Suarez-Orozco & Suarez-Orozco, 2001).

Although psychologists quantify strength of ethnic identity using validated instruments such as the MEIM-R, ethnic identity itself is not a fixed entity (Phinney, 1992; Phinney & Ong 2007). In fact, Jean S. Phinney and Anthony D. Ong characterize it as “multifaceted” and “dynamic” (2007, 273). Moreover, ethnic identity is individually defined. Members of immigrant communities both expect and are expected to commit to their ethnic identity differently based on their position within their group. For marginalized individuals, the process of exploration may uncover oppressive norms associated with committing to an ethnic identity that more powerful members of the community narrowly define and impose upon other, less powerful members as the “correct” way to commit. Consequently, marginalized individuals may find themselves facing the choice of committing to their ethnic identity and sacrificing beliefs, personal liberty, and dreams, or rejecting their ethnic identity and being criticized, condemned, or ostracized by co-ethnics.

Such is the case for South Asian American Muslim women. In South Asian communities, regardless of their religious affiliation, gender dramatically affects the expectations associated with embracing one’s ethnic identity. “South Asian” is defined as any individual who traces his or her origins to any country on the Indian subcontinent, including Bangladesh, Bhutan, India, Pakistan, Sri Lanka, Nepal, Afghanistan, the Maldives, and Tibet. Regardless of national, linguistic, or religious background, South Asian American families and communities are more likely to restrict girls in their abilities to socialize (particularly with the opposite gender), wear American clothing, and engage in American practices (Dasgupta & Dasgupta, 1998; Miller, 1995; Purkayastha, 1995). Whether they discussing household rules, marital traditions, or academic expectations, South Asian girls and boys consistently report that male relatives not only operate under fewer and more lenient rules, but are also more easily forgiven for breaking these rules (Purkayastha, 1995). For South Asian American Muslim women, committing to a community-defined ethnic identity can mean accepting oppressive, inconsistent, and gendered norms.

In the following study, I draw on 17 ethnographic interviews I conducted with 18 and 19 year old South Asian American Muslim youth. (These interviews are from a larger set of 30 interviews and 57 surveys I collected in the past year.) The young women in this study use commitment as a vehicle for publicly critiquing insider and outsider perspectives on South Asian American Muslim identity. For many of these women, commitment is a form of activism. The process of commitment, and insider and outsider reactions to commitment, reflect the ways in which South Asian American Muslim young women use the Internet both push at and strengthen the boundaries and definitions of ethnic identity. The Internet therefore functions simultaneously a space for activism and conservatism, questioning and censoring. This study explores how South Asian young women do this, and speculates on ways such practices can be used to inform pedagogy and practice.

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Technology, Policy, and the Design of Programs in Educational Administration

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Introduction
Graduate programs provide a needed opportunity to educate our future administrators on the practical and pedagogical use of technology in education. Preparing administrators to lead with technology is of great concern to the continued growth and development of meaningful 21st Century learning experiences in schools. This paper will explore technology policy and practice within the design of graduate degree programs in educational administration. Results from a small pilot study will be used to address two primary research questions:

1. Do state requirements for professional certification influence the integration of instructional technology coursework into the design of graduate programs in educational administration?
2. What role does the National Council for Accreditation of Teacher Education (NCATE) play in the inclusion of technology-based content into the design of graduate programs in educational administration?

Motivation for the study
The motivation for this study was guided by experience with large-scale technology integration efforts in a university research and development center. What has been learned is that the sustainability of teacher professional development initiatives hinge on the support of administrators and their ability to share in a vision for 21st Century learning (Mineo & Meier, 2008; Meier & Mineo, 2008). These understandings are not new; the role of administrators has been included in larger discussions around educational change for years (Fullan, 2001). Recognizing this, the International Society for Technology and Education (ISTE) established National Educational Technology Standards (NETS) for administrators in 2002. While we are focusing more on these guidelines in practice, are we using them to better prepare our future leaders at the graduate level? Based on work at the university center (Meier & Mineo, 2009), we could argue that administrators are wholly underprepared to lead with technology (see also, Dawson & Rakes, 2003). Relating these understandings to the development of graduate programs for administrators is a rather new consideration within the field of educational technology. It is the author’s hope that these findings will translate into future study on the design of educational programs for administrators, state policy requirements, and their relation to the growth of 21st Century schools. This smaller pilot study has been a necessary step toward this overall goal.

Major aspects
The involved study was an initial pilot effort to identify successful strategies in the preparation of administrators for 21st Century schools. At this initial stage of research, the goal was to survey current trends regarding the integration of technology into pre-service programs in educational administration. Major aspects of the study included the implication of policy-decisions at the state level, and their relation to how technology has been addressed within these programs.

A layered approach to the collection and analysis of data was made as follows:

Surveying state requirements (policy)
An online survey of state departments of education (i.e., New York, Florida, California, Texas, Illinois) yielded documentation regarding requirements for the preparation of educational administrators. Purposive sampling strategies were then used to identify three states for further review: New Jersey, Maryland, and Virginia. These states represented a difference in approach and/or language with regard to their inclusion of technology into preparation requirements (see Table 1). At the same time, the author attempted to control for geographical region (North East), size (10 < n < 20), and educational rank (top 5%; Ed Week, 2009).

Identifying design of graduate programs (practice).

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Within each selected state, all programs leading to the certification of educational administrators were chosen for review. For the purpose of this research, a survey of online resources yielded qualitative information on each institution’s program of study and related technology-based coursework. This information was then scored using a rubric aligned to the National Educational Technology Standards (NETS) for administrators (International Society for Technology in Education, 2009). A quantitative analysis of these scores was then made to identify potential relationships.

Table 1. State policy: Examining the language.

<table>
<thead>
<tr>
<th>State</th>
<th>Technology Standards for Administrators</th>
<th>Initial Licensure Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Jersey (n = 17)</td>
<td>Administrators have knowledge and understanding of the role of technology in promoting student learning and professional growth. *Taken from the New Jersey Professional Standards for Teachers and School Leaders (Revised 2004)</td>
<td>N/A</td>
</tr>
<tr>
<td>Maryland (n = 12)</td>
<td>Use technology and Multiple Sources of Data to Improve Classroom Instruction: * (Administrators will) demonstrate proficiency in effectively using the appropriate technology for students, staff and administration. *Taken from the Maryland Instructional Leadership Framework (Revised 2005)</td>
<td>N/A</td>
</tr>
<tr>
<td>Virginia (n = 18)</td>
<td>* Instructional personnel shall be able to use educational technologies for data collection, information management, problem solving, decision making, communication, and presentation within the curriculum. *Taken from the Virginia Technology Standards for Instructional Personnel (Revised 1998)</td>
<td>•Required course in technology</td>
</tr>
</tbody>
</table>

**Preliminary Results**

Preliminary results from the pilot study indicate that:

1. There exists a statistically significant relationship between the emphasis a Graduate Certification Program for School Administrators places on technology and the State for which they were approved ($\chi^2(df=2, n=46) = 7.69, p < 0.05$)
2. There is no relationship between the emphasis a Graduate Certification Program for School Administrators places on technology and NCATE status ($\chi^2(df=1, n=46) = 0.29, p = 0.592$). See MIneo & Meier (2009) for additional results.

**Limitations**

At this point, the limited size of the sample makes it impossible to generalize results. However, it is the author’s hope to expand this pilot study in time for TCETC, by gathering data on additional states as they related to various levels of policy implementation. In this way, the author may better connect the aforementioned relationships to the design of policy rather than State alone.

**Discussion**

**Relating policy and practice**

Results from the review of graduate programs indicate that there is a probable relationship between policy and practice. Potential implications for policymakers include: design of State standards for administrators, and decision to mandate a technology course requirement for administrator certification.

**Examining national standards**
Results from the study indicate that a graduate program’s NCATE status does not relate to their integration of technology. This leads the author to question if graduate programs have fully realized the NCATE standards.

References


THINK: A Design Framework for the Use of Social Networks and Mobile Technologies as Platforms for Situated Inquiry Learning in Science

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It has been the goal of science education reformers to have the teaching of science more closely approximated to the practice of science. This paper proposes the use of open source social network applications and ubiquitous mobile technology for sustainable, scalable implementation of situated science learning. It also proposes a five-prong design framework (THINK: Trigger, Harness, Investigate, Network and Know) to guide the creation of authentic science learning environments with these technology tools.

Introduction

It has been the goal of science education reformers to have the teaching of science more closely approximated to the practice of science. There have been various efforts at exploring the use of technology for authentic inquiry-based science learning (Pea, 2002). Through the CoVis project, Pea described the multi-dimensional role of information and communication technology in learning (Pea, 2002). Using an open source social network software called Ning (www.ning.com) to create a customized social network, parallels can be drawn between the roles played by technology described by Pea, and the affordances of a combination of social network and mobile technology. With the emergence of Web 2.0, the open source software revolution, and ubiquitous mobile technology, it is proposed that the vision of CoVis and other similar projects like Global Lab (Feldman, Konold & Coulter, 2000) can be achieved on a faster, much less resource-intensive, yet authentic manner to render the approach both scalable and sustainable.

THINK: A Design Framework

The most fertile use of technology in adapting scientific practice for the purposes of science learning has been in the adaptation of scientific tools, techniques, and resources. Edelson (1998) described four strands that facilitate the adoption of the attitudes, techniques, and social interactions that characterize the scientific community. These strands are: 1) collection and sharing of data, 2) analysis of data through modeling and visualization, 3) evidence gathering and evaluation, and 4) communication and collaboration.

In spite of the affordances and ease of use of open source social network software to create focused social networks, it is still not realistic to expect that these tools will naturally fall into place to realize Edelson’s vision along the four strands listed above. A five-prong design framework (THINK, an acronym for Trigger, Harness, Investigate, Network and Know) is thus proposed, to guide technology use and design of the social network for authentic science learning.

(i) TRIGGER

To support an inquiry-based approach to the teaching of science, the social network should be used as a platform to trigger thinking in the students. The key is to design a social network with the feature of allowing for teachers to pose Trigger activities to whet students’ curiosities, and to develop inquiry-based investigations following the Trigger.

(ii) HARNESST

Consistent with Edelson’s vision of authentic science learning, students need to be able to explore information and resources available, and to harness enough knowledge in order to derive meaningful questions for inquiry. Any social network designed for situated science learning should allow participants to harness resources through artifact tag-and-search functions, content repositories, and information exchange.

(iii) INVESTIGATE

Sandoval and Reiser (2004) articulated an important consideration in approaching inquiry learning from the standpoint of cognitive apprenticeship into scientific practice, and that is the importance of guiding students in formulating researchable questions and to conduct informative investigations. A social network designed for situated science learning should incorporate applications for formulating questions in response

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to Trigger events, and after reflection upon the resources and information harnessed. Mobile technologies may be used in data collection, as investigations can take the learner out into the field. Data sensors enable the learner to engage in authentic investigations, and to send the data to a central workspace on the social network. Geographical Positional System (GPS)-enabled devices allow the data collected to be geotagged. Mobile technologies with a central collaborative space on the social network allow for a distributed approach to science investigations, consistent with current concepts of distributed cognition (Gomez, Fishman & Pea, 1998).

(iv) NETWORK
One of the key roles of the social network is to serve as a platform for engaging in scientific discourse – to network. In the context of science inquiry in a social learning network, the discourse could be in the form of discussion around pieces of data or artifacts and how they support and shed light on the research questions. It could be a response to thoughts, experiences and ideas shared by others in the community. The social network has to be designed to encourage and facilitate scientific discourse through the juxtaposition of data with discussion.

(v) KNOW
The principle of knowing should be applied in the design framework at two levels: at one level, the social network should facilitate the learners’ ways of knowing, to have a structure and scaffold to encourage metacognition. Features like personal blog spaces naturally lend themselves to this, but the learning environment should be designed to guide the learner in meaningful reflection about their data, results and conclusions of their investigations, as well as to be metacognitive about their ways of reasoning. At a different level, the principle of knowing should also be applied in the area of formative assessment. Science assessment has always been conducted in the form of formative evaluations of concept attainment. Pellegrino, Chudowsky & Glaser (2001) described the problem of assessment faced by educators today, and proposed a rethink of the fundamental approaches toward measurement of how much and what students know. The THiNK framework proposes a situated approach to assessment to support the situated learning it designs for. The interactions, discourse, artifacts, reflections that learners engage in provide rich data which present a more accurate picture of what a student knows, than his tests scores can. Sandoval and Reiser (2004) presented epistemic components of explanation rubrics used in their study, which included criteria like (i) thoroughness and clarity of explanations; (ii) use of data; (iii) ruling out alternative explanations; and (iv) documenting the limitations of explanations. Evidence of these can be easily captured and called up when the inquiry-based activities are conducted in the context of a social network: consequently the social network should be designed with this principle of knowing in mind.

Further Work
This paper has sought to turn the attention of science educators onto the use of technology tools, specifically social networks and mobile computing, that students of this generation are so comfortable with, and leveraging on these tools for participatory learning, and situated inquiry learning of science. Rather than to create a separate application to draw students in to, this paper has proposed situating the learning right in the context of the learners of this generation. Working with principles of scalability and sustainability, it is deliberately anchored on open source software and ubiquitous mobile solutions, rather than on expensive, proprietary, customized software. It has also proposed a design framework that is aligned to the principles and goals of situated inquiry-based science learning. The application of this framework ensures that the design of the learning environment is driven by sound research-based pedagogical approaches rather than by a mere focus on technology use. A prototype of the social network is currently being built, incorporating various mobile computing technologies, to be field tested with high school students. We are poised to conduct iterations of design research to derive learning points to inform future work.

References


The Uselessness of Literature: Why New Literacies Will End the Teaching of Literature

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It has been commonplace recently to pit literature against technology. We read in the news about librarians who are putting books down in order to teach basic information-based research techniques (Rich, 2009). Or, respected voices weighing the effects of new literacies on reading (Gardner, 2008). In another instance, we hear the concerns teachers have that text messaging and online practices are supplanting students’ study habits (Rich, 2008). While on the one hand we read about President Obama’s own love of reading and writing (Kakutani, 2009), his Secretary of Education seemed fine with the dichotomy of books vs. "those electronic gadgets" (Dillon, 2009). English teachers, whose work has always been rooted in literary works, (Applebee, 1974), are understandably affected by new technologies and the literacies they make possible.

On the other hand, literature has been taught as many things: an extension of Christian dogma (Applebee, 1974; Graff, 1987), as a structured object to be deconstructed (Scholes, 1998), and even as a political tool (Scholes, 1986). None of these approaches to literature argue convincingly for its value, however. They assume the value of literature. Furthermore, I suggest that even many groundbreaking works on teaching literature—transactional theory (Rosenblatt, 1983), the balancing of reader experience with authorial intention (Rabinowitz & Smith, 1998), the role of imagination students’ private readings in schools (Sumara, 1996)—while of immense importance, ignore this historical problem that teaching literature has been, at best, tolerably useless. That is, it is use-less and lacks the utility of other disciplines: physics can send human beings to the moon, foreign languages can allow people of different backgrounds to communicate, history teaches students to participate in government. Useless.

At the end of his book, Applebee (1974) lists a number of issues the field must confront. He articulates one thus: “The knowledge and goals of the teaching of literature are in conflict with the emphasis on specific knowledge or content” (246). Here he means that English teachers are uncomfortable defining teaching literature “as a body of knowledge” because their goals are not knowledge-based but are “questions of values and perspective” (ibid). That is, teachers of literature have been, according to Applebee, in the business of literary experience and imagination. Thirty-five years later, I argue, this is still very much the case. However, we now face a new problem. It is the English teacher who is being tapped to help guide education into this era of new literacies. But, new literacies research cares little for the imaginative and aesthetic experiences valued by teachers of literature. How can a field that has only held on to the teaching of literature by historical happenstance defend literature against newer literacy needs?

After a brief review of some of the most prevalent voices in new literacies studies—a Coiro, Knobel, Lankshear, and Leu (2008), Alvermann (2008), Tierney (2007)—I issue a call to others in English education. Teachers of literature must make it clearer to the public, to themselves, to our students why teaching literature is important. It is something the field has failed to do. The result has been the slow suffocating of literature in schools. We must accept that not all students will be English majors and that reading literature does not have to mean reading like a professor. New literacies has much to offer the teaching of literature, but it is up to us to make it clear what is teaching literature and what is not. What we need is a New Literatures movement. The Old Literatures approach has taken us as far as it can.

References

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Using a Collaborative Knowledge Base and Multimodal Composition for Understanding and Applying Rhetorical Devices in the High School Classroom

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Often students have a difficult time transferring content studied and knowledge gained in literature class to their own writing. A student may recite a perfect textbook definition of a literary term or device, but can’t identify that same term or device in various pieces of literature or effectively use it in his or her own writing. How can multimodal instruction and teacher facilitated peer collaboration help students develop higher levels of thinking, synthesis and meaning making?

Using asynchronous discussion boards, I asked my students to respond to teacher and peer generated questions about the text. These discussions developed into a knowledge base of analysis, synthesis and multiple connection points for students to relate to the text in ways I alone may not have been able to anticipate or create. Through scaffolding, discussion becomes rich with inquiry that provides a springboard into composing an original satire. Together students select written, visual, and auditory examples of satire to share and discuss in the collaborative environment. Students learn to identify and make connections to self, text, and the world through a collaborative asynchronous environment that promotes cognitive apprenticeship.

As a final learner centered assessment and demonstration of synthesis, I ask students to compose a narrative satire that focuses on high school culture. To accomplish this task, students must complete a writing process that starts with written prose and develops through the use of a storyboard into a multimodal narrative poem using Microsoft Photo Story. Referencing the asynchronous knowledge base for examples, students are asked to construct and demonstrate written, auditory, and visual instances of literary devices to develop a strong and coherent narrative and demonstrate transference of knowledge.

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Virtual Teaming in Design Courses: A Comparison of Design Collaboration and Outcomes Between Face-to-Face and Virtual Engineering Design Teams

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The use of digital technology has become ever present in the workplace as a means of teaming and thus is emerging as an important aspect of the classroom. This quasi-experimental study examines the designs of two teams in a mechanical engineering design course. One team chose to meet in person for out-of-class meetings, and the other through virtual means. Despite this difference influencing the design approach, the final designs appear similar.

Background

Virtual teams, teams where members communicate primarily through the use of technology (Powell, A, Piccoli, G & Ives, B, 2004), are becoming a norm in most engineering work settings. Virtual teams often come together as needed in order to complete deliverables outlined by the customer (Powell et al, 2004; Chase, 1999; Lipnack & Stamps, 1997). These virtual meetings have been shown to increase the productivity of the team members and promote participation (Aiken & Riggs, 1993). This study compares two student teams that designed the same object but with one team predominantly using technology and the other using face-to-face interactions. We examine the impact that virtual team meetings have on team interactions, design processes, and design outcomes in an undergraduate engineering design course by addressing the following questions:

RQ1: How does technology influence team collaboration on a design?
RQ2: How do the deliverables and final designs differ between face-to-face and virtual teams?

Methods

Participants

The participants in this study were two teams, each consisting of three members, which were enrolled in a mechanical engineering design and economics course at a large land grant university in the southeastern United States. Both teams had chosen to design a replacement for the current desks provided to students in the dorm rooms. The virtual team was made up of three male students, two of which were in their second year of a mechanical engineering degree. The third member was a graduating senior that had transferred from another engineering institution. The face-to-face team was made up of two male and one female student, all of which were in their second year of a four-year mechanical engineering degree. All students in the course met three times a week for 50 minutes and were required to use tablet PCs for class communication and the completion and submission of class assignments. Due to the limited timeline of the course, students were required to work on their designs outside of the classroom. Without any prompting or encouragement from the research team, the face-to-face team agreed to meet in person and the virtual team decided to meet in a complete virtual environment outside of class using OneNote share sessions and AIM chat rooms.

Data Collection and Analysis

The majority of the observations and team meetings occurred during the second phase of the design course: Design Phase 2 (DP2): Conceptual Design. During the class meetings, both teams were recorded using digital video cameras and digital audio recorders. When possible, the OneNote share sessions between teams were recorded using Camtasia. This format of data collection continued with the face-to-face team meetings held outside of the classroom. Camtasia was also used to record the OneNote share sessions and AIM chat rooms during out of class team meetings for the virtual team. In addition to the video and audio, all deliverables, team logs, and peer evaluations were collected at the end of the semester for both teams. Analysis included the open coding of team interactions (Strauss & Corbin, 1998), and a content analysis of design documentation and final designs.
Findings

As the design process progressed, distinct differences in the teaming approaches emerged between. There are three main approaches to virtual teaming: the wheel, modular, and iterative approach (Nemiro, 2002). The face-to-face team used an iterative approach described by Nemiro. During, conceptual design and item scoring, team members frequently collaborated on ideas. Phrases like “I am just throwing this (idea) out here...what do you think” were frequently used by the team members. This would be followed by a discussion by all group members which manifested in a conceptual design that saw several iterations before being placed into a scoring matrix. In contrast, the virtual team approached the design task from a modified modular approach. Throughout the design process, the teams communicated, but rarely collaborated on ideas. Each member worked independently and at milestones all components of the design were brought together.

As part of the requirements for DP2, teams were to determine the functions of the design and to brainstorm several solutions. Despite differences in team collaboration, both teams included functions that dealt with the storage of books and office supplies, power management, cable management, and workspace. The face-to-face team expanded on the storage of books and office supplies, incorporating organization and protection of paper as well. The virtual team added functions related to laptop, monitor, printer, and miscellaneous electronics location, and lighting, which were not considered by the virtual team. It can be surmised that both teams approached the design from two different perspectives. Team Tech was focused on the breadth of design capabilities, while Team F2F was concerned with the depth. Despite this fact, an examination of the teams’ respective final designs, seen in Figure 1, shows that the overall designs are similar.

![Virtual Team Final Design](image1)

![Face-to-Face Final Design](image2)

Figure 1: The design outcome of the virtual and Face-to-Face Teams.

Conclusion

The team demographics and the use of virtual or face-to-face meetings impacted the teaming process and collaboration. The limited communication present in the virtual forum, made the modular approach ideal. This facilitated a design that had more features as well, since each team member focused on a specific portion of the design. The iterative approach utilized by the face-to-face team allowed for more collaboration, compared to the virtual team, and provided a design that was focused on specific components.

Acknowledgement

I would like to thank Dr. Aditya Johri for the opportunity to be involved in this study and for his guidance throughout the process. I would also like to thank Dr. Christopher B. Williams for his guidance and support. This work was supported by NSF Award# ITR0757540.
References
## TCETC 2009 Schedule At a Glance

|---------------|-----------------------------------------------|---------------------------------------------|
| 9:00 – 9:30 a.m. | 1. Registration*  
2. Breakfast**                                                                         | 1. Registration*  
2. Breakfast*                                                                         |
| 9:40 – 11:15 a.m. | Web 2.0***                                      | Games"                                      |
| 11:30 a.m. – 1:00 p.m. | 1. Citizenship & Connectivity***  
2. Language Learning§                                                              | 1. Ethics"  
2. Media Literacy"                                                                  |
| 1:00 – 2:00 p.m. | Lunch**                                        | Lunch**                                     |
| 2:00 – 3:30 p.m. | 1. Web 2.0***                                   | 1. Computer Mediated Communication"  
2. Understanding Systems§                                                          | 2. Active Learning"                                                                  |
| 3:45 – 5:15 p.m. | 1. Culture***                                    | Technology Integration and School Change°  
2. Posters & Demonstration§                                                          |                                                                                      |
| 5:15 – 6:15 p.m. | Workshop‡                                      | Workshop‡                                   |

### Room Locations
- * Zankel/Main Hall Entrance
- *** 263 Macy Hall
- ‡ 322 Thompson Hall
- * 431 Horace Mann Hall
- ** 109 Zankel/Main Hall
- § 173 Macy Hall
- ° 229 Thompson Hall

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### Teachers College • Entrance Level

[Map of Teachers College, showing wheelchair accessible and inaccessible facilities.]