Digital Learning and Play: A Synthesis and Elaboration from a CILS Bay Area Institute Roundtable

Sherry Hsi, The Exploratorium

I. Background

In the August of 2005, a two-part discussion among scholars, education researchers, graduate students, museum professionals, evaluation experts, and educators took place at the Center for Informal Learning Technologies annual meeting, the Bay Area Institute. This roundtable had the goal of advancing conversation among researchers and practitioners who are interested in examining the informal learning and play that takes in settings that are mediated by digital-based technologies. The discuss was intended to generate synergies and collaborations for concurrent investigation of design studies to better understand learning, motivation, and play in digital environments among youth and young adults. The following is a synthesis, elaboration, and summary of the discussions that took place over the two days.

II. Key issues in digital learning and play

If you observe what children, teens, and young adults choose to do with there leisure time, some of these activities will involve both individual and social interactions taking place within the context of electronic, Internet-based, and/or digital technologies – watching TV, browsing the Internet, sending messages on a cell phone, exchanging digital songs, writing in personal online diaries, chatting with friends on the Internet, playing video game boxes, and consuming digital media in various forms. This attraction and engagement with electronic media and tools is not limited to non-school hours, but also in museums. Museum practitioners report that youth in museums are hunting down computer-based exhibits/kiosks, and have better holding time than traditional object-based museums.

Many youth today have grown up in a digital world in which their preferred form of engagement and entertainment is mediated by technology and the predominant form of out-of-school learning is by navigation through digital information and online spaces. Stories of youth falling asleep with mobile phones under their pillow or playing massive multiplayer online role playing games like World War Craft for months at a time are examples of these social practices in which youth are always "on" and "connected" with their peers because digital technology is mixed into the context of everyday activity and everyday routines. This phenomena of digitally-connected youth is not only taking place in the U.S., but internationally, driven by ubiquitous access to mobile phones and the Internet, and the rapid scientific and technology advances that continue to increase the communication, computational, and storage capacity of portable networked computing devices at lower costs and lower power requirements.

Youth are using the tools that are immediately available to them and in many cases, customizing and adapting them to their own use, displaying fluencies in using information and new media technologies (Lenhart & Madden, 2005; Lenhart et als., 2005). Unlike prior computer-based programs or electronic media, digital technologies

are networked linking peers to each other and "open" allowing content to be authored and digital annotations to be made. Researchers and practitioners alike report that youth are adapting media and creating their own cultures taking their favorite stories and rewriting them in online fiction communities (Jenkins, 2004; Ito, 2005). Viewed as a form of cultural production, youth are establishing their own set of norms, social relationships, and practices – working and playing in online play spaces "hacking" computer programs, creating "mods", and personalizing digital environments.

Young adults critique and contribute sources of digital information based on a system of social reputations rather than from a single authoritative source. For example, in Google news, multiple views on the same story can be collected and rank based on how often they are being read. In Friendster.com, WhyVille.net, and Wikipedia.com, members of online communities jointly produce knowledge for its community members as well as verify the sources of information that are posted. Another example of this practice is ethnographic research on the technological fluencies of undergraduate engineers carried out by Bell and Zimmerman, documenting similar online community social norms. These undergraduates have established sets of blogs used to share various kinds of information associated to their technological activities. The distributed, informal learning community concurrent grows an information database and hence its utility through a shared social expectation that individuals systematically contribute newly created information (Bell, 2005).

The knowledge, skills, and practices that are developed during digital play are often questioned as a legitimate form of literacy, and in some cases, viewed as a competing and detrimental force in school performance, career development, and productive life. As these interactions and activities take a central role in the lives of youth, educators, teachers, parents, schools, and education policy makers are also paying serious attention to how youth's play activities with digital technologies might interfere with schooling, pose challenges for teacher professional development, and/or contribute to traditional forms of literacy. New questions emerge:

- What does research say about the nature of play and learning in these digital environments and the impact this might be having upon youth, young adults, and their schooling?
- How are these technologies changing the cultural and geographic boundaries of children?
- What happens when feedback is immediately instant?
- What becomes the role of the material world especially in learning environments that are predominantly object-based?
- How have researchers and practitioners tried to understand participation and learning in digital play?

These and other new questions are emerging from research in out-of-school settings and research in the interdisciplinary learning sciences aimed at understanding the relationships between informal learning, digital play, and formal schooling.

III. The current state of knowledge and practice

Several studies have been conducted that include survey studies and literature reviews, one which was based upon a project funded by the MacArthur Foundation on digital-mediated learning by youth (see Lyman et als, 2004; The Children's Partnership, 2005). The Pew Internet Studies on teen's use of the Internet as well as statistics gathered by National Center for Educational Statistics confirm the engagement of children online, examining student's television watching, Internet use, and performance in school (Lenhard, 2005; NCES, 2003) . The technology fluencies that youth are developing with digital technology has also captured the attention of the U.S. National Academy's Board on Science Education, who recently convened a panel in October of 2005 to address the issues surrounding the role of technology fluency in high school curricula or out-of-school activities.

To understand digital learning and play, it will be important to recognize the various multiple and different perspective available to study the interactions and activities taking place in these environments. One perspective is to conceptualize the actions of youth as play, examining the characteristics and types of play (Hutt, 1973) and the agency, intentionality, and seriousness that young adults take on play-like activity (aka "deep play") (Geertz, 1973). While children are playing, they are also developing competencies in goal-oriented tasks like online games or simulations, and also practicing and rehearsing important life skills.

A second, more common perspective is an examination of the technology fluency and 21st century skills, examining what problem-solving skills and interpersonal team-based skills are learned and how these will contribute to preparing youth for the future scientific and technological workforce. In some cases, these fluencies are broken down into specific competencies and benchmarks to assess technology literacy and skills.

In cognitive studies of digital literacy, the specific representations and annotations of those representations that learners create and their reasoning behind them are also examined (cf. DiSessa). Given that many of these online and digital-based youth activities take place among peers and groups, social cultural researchers that draw upon activity theory and theories of distributed cognition examine the collaborative practices that take place in digital environments. (see Hutchins, Pea, Koschmann). Overlapping in this tradition is to specifically examine the social exchanges, intent participation, discourse, "repertoires of practice" and language development within the online medium (cf. Rogoff, Gutiérrez). Prior research on studying child development and the prevailing social practices as children form new cultural worlds and systems of activity could also contirbute to understanding youth development in digital learning environments. (see Nespor, Kyratzis)

Digital play is also examined as identity formation – alternative identities, gender identity, and youth identity development (cf. Turkle) With the open system architecture of new video games, personal expression, invention of new identities (e.g., names, costumes, play objects, worlds) are possible.

Because online environments stretch the physical boundaries in which informal learning can occur, one lens to view activity is the new cultural geographies defined by children's negotiations of space and time.

In summary, many different approaches exist drawn from anthropology, sociology, user experience design, museum-based research, psychology, and other social sciences for examining the activity, play, and informal learning that may take place in digital learning environments. Nascent methods are emerging from information and computer sciences that make use of web, networked, and media tools to assess learning and activity.

IV. Where we want to go? An agenda for research and practice

Collaborative targeted design studies on youth

An opportunity exists to both draw upon prior research and a wealth of theoretical perspectives to study informal learning especially in the context of interest-driven activities of youth in digital play spaces and an examination of students' activity across settings that youth roam from school to out-of-school, and in homes. Given some ethnographic studies have already begun in this area (see Lyman), the next step would be to examine and plan synergistic, targeted design studies. This could be initiated as a joint research workshop between the Center for Informal Learning and Schools and the Center for Informal and Formal Learning Environments, Center for the Assessment and Evaluation of Student Learning and other researchers interested in investigating online assessment of learning, digital learning, and play to work together.

Aggregation of research methods

The collection of different methods and share their strengths and weaknesses is an opportunities for synergy, especially aggregating studies across study centers, test beds, laboratories for children and technology. Web-based methods to capture online behaviors in the background as well as engaging youth as informants in their own thought processes are two examples. An opportunity also exists to conduct research that looks at the flow between in school time and out of school time and the nature of personalization and customization of digital technologies, especially when digital information, cell phones, email, and other online information that supports the social worlds of kids bridges activity in the classroom and activity out-side outdoors the classroom.

Address and innovate upon human subject issues

One issue that will need attention is working through issues with institutional review boards for human subjects for minors. For example, research that falls outside of school time in which children's online behaviors and activities are captured, or youth are asked to be self-data collectors by writing in online diaries and photographing their parents, siblings, and home life poses new challenges. Children become informants not only of their own activity and educational practice, but as informants of others and other aspects

of family life creating issues of privacy. Research in online contexts or in learning contexts that crosses institutional boundaries (e.g., mobile cell phone use, Internet accounts) that govern different norms for the protection of human subjects will need to be address. Some promising examples of camera and multimedia studies that have passed institutional review boards exist (cf. Philip Bell, Coeleta Stafford).

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