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Team Cortona Position Paper: The Case For Learning Technology

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Introduction

There is a dispute in learning regarding the high cost of instructional technology and its value as a learning tool. It is an important debate. Over 70 billion dollars have been invested in instructional technology in higher education with 20 billion going to support teaching and learning leading up to 1994.(Geoghegan, 1994) It is estimated that companies will spend as much as 10,000 to 16,000 dollars per hour for professionally developed e-learning training material. The web site Teachlearning (<http://www.teachlearning.com>) reports the total 2006 instructional technology budget for US schools was estimated to be \$6.8 billion. With billions of dollars allocated to instructional technology, is it reasonable to ask if this investment is worth it?

There is a large body of research that examines the field of instructional technology. Some research supports it while other research rejects the use of instructional technology in teaching and learning. It is important to note that there has been a “poor quality of Educational Technology Research and the poor quality of the inputs to research syntheses in the field of instructional technology” (Reeves, 2000). It is important to consider how the researcher is examining the instructional technology and aligning their goals and paradigms to those of the organization. Will instructional technology be used for compliance training or housing communities of practice for organizational learning? Will the instructional technologies deliver computer based training or be used to create a network of learners sharing ideas? The type of instruction is important to consider before making a judgment on value.

Our group believes that the instructional technology is only as good as the design of the instruction the technology will help to deliver. In this paper we will make the argument that instructional technologies are only as good as the instruction designed to take advantage of the proper learning processes.

Position Paper: The Case for Learning Technology

The Classic View

The Classic View of learning is a theory that believes learning is accomplished through work, particularly in the collective work of a community, where culture and history are mediators for development (Vygotsky, 1978). Cultural tools such as language, physical artifacts, common knowledge and beliefs and conventional patterns of behavior are part of any group and create a cognitive “footprint” for constructing knowledge (Hatano & Wertsch, 2001). It is the learner who determines the goal of the activity and whether that goal has been accomplished (Roth & Lee, 2007).

The process of learning through collaborative work and shared cultural experiences is how learning largely took place until the Industrial Age. With Industrialization came the need to teach multiple children at the same time, causing the Committee of Ten, a group of prestigious educators that included Charles Eliot (then President of Harvard University), to be tasked by the National Education Association (NEA) to come up with a standardized national curriculum (the Official View) for American high schools that could benefit all students, cultivating a “mental power” to observe and to reason (Eliot, 1899).

The Official View

According to the Committee of Ten, the goal of a liberal arts high school education was to prepare one to become a thinking, reasoning, productive member of society, with a lifelong desire to learn, even after coursework was completed (Powell, 2003). The resulting standards-based curriculum became the Official View of learning and at first glance, appears to be directly in opposition to the Classic View (see table 1). The Official View seems to take the responsibility for learning and goal attainment out of the hands of the student, placing the center

of gravity in the functioning of the “system,” that web of activities and pre-determined goals that will hopefully churn out millions of students who can make creative, intelligent decisions about the remainder of their lives (Nardi, 1996). Of course some set of standards are necessary; there are too many learners in the education system to have an ad-hoc approach but is it possible within that system to have a mechanism for children to develop their own activities and become individually engaged enough within a community for deep learning to take place?

Table 1

Comparison of Classic and Official Views of Learning

	Classic View	Official View
Overview	Learning happens when we are in the course of community-based activity (i.e., Activity Theory)	Learning happens when we are given pre-determined assignments to meet some specific objective (i.e., Distributed Cognition)
Who determines what makes the activity relevant?	The Learner	The System
Who determines the goal of the activity?	The Learner	The System
When is the goal of an activity determined?	Reflectively, after the activity	Before the activity takes place

Best Practices in Design

The Classic and Official views of learning seem to be in opposition to each other but there are common threads that make it possible to design a curriculum that enables students to make learning engaging, relevant and personal. First, learning in any environment requires a strong curriculum with clear outcomes and methods for assessing the proficiency of those outcomes (Browne, 2003). Students need to understand how they will be assessed and how their assignments are to be delivered, particularly if some digital medium is to be used. The challenge for educators is to create conditions that enable a learner to receive concrete input, reflect on what has been taught, connect this input with what has already been learned through personal experience, and then translate it into new knowledge that is actionable (Zull, 2002). This is where deep learning takes place, creating a transformative experience that will be more useful in long-term cognition than many existing learning methods (Anderson, 2004).

A New Learning Theory

Learning theories are constantly evolving. Brenda Mergel (1998), a graduate student in educational communications and technology at the University of Saskatchewan, has compared the development of Behaviorist, Cognitive, and Constructivist learning theories to the development of atomic theory. This might be considered an entertaining point of view but a comparison could be made between the development of these learning theories and the shift from an industrial to a post-industrial economy. Now, it is widely believed that we are leaving our post-industrial period and entering the information economy. George Siemens (2004) believes he may have a theory for learning in the information age. He has coined the phrase “connectivism” for a new model of learning that is an underlying principle in the Web 2.0 phenomenon. Siemens states that learning is a network forming process. Unlike traditional educators, he believes that

connections are the start of the learning process, not the content. He argues that content is the byproduct of the learning process and not the start of it. Learning rests in the “aggregating” of diverse and even opposing views. Siemens goes on to state that knowledge resides in communal networks and not only within the learner.

Web 2.0

Web 2.0 is a suggested next generation or version of the Internet. This Web 2.0 phenomenon is caused by two fundamental Internet changes. The first of these changes is technology-based with new web based products that provide a user-friendlier interface which lower technical barriers and allow for easier Internet publishing of a variety of content. People no longer need to navigate complex server protocols and use hypertext markup language to publish information on the Web. Now in Web 2.0, new technologies remove technical barriers and allow for easier publishing on the Internet. These new tools also allow for ubiquitous access from a variety of devices providing anytime anywhere availability. Web sites look more like interactive applications rather than a place for static content.

Because Web 2.0 exists on a network, it allows for easy social connections. Now, everyone can create and publish content with ease. Web 2.0 uses social software to connect individual participants on the web. There has been a shift from a static one-way resource to a read-write web. In this new paradigm information is no longer pushed in a top down manor but created and distributed in a two-way grass roots bottom up approach where information can be pulled and controlled by the end user. This has lead to an open source mentality by those who use these tools creating a free exchange of content and ideas that are shared and re-mixed in new and creative ways. These changes make for new and exciting tools that have great potential for e-learning.

Professional Learning Communities

Professional Learning Communities (PLC) are "Educators committed to working collaboratively in ongoing processes of collective inquiry and action research to achieve better results for the students they serve." These structures are designed to provide a discussion-based model for school building based personnel focused on school improvement.

In larger organizations, communities of practice (CoP), considered cousins of the PLC, are formed by people who connect in a practice of collective learning in a shared field.

Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. It shares many of the same features of a Professional Learning Community. The PLC concept was brought to life in the education sector, but communities of practice exist in business, government, associations, and education. Some of the characteristics shared between the two include:

- Collaboration with peers to share knowledge and improve practice
- A focus on continuous improvement through knowledge-sharing, practice, and reflection
- Collective inquiry into best practice in the group's field or occupation

Personal Learning Environments

Jay Cross (2006) argues that only 10 -15 per cent of learning is formal, that 85 per cent of our learning takes place outside of formal settings. Personal Learning Environments (PLEs) could bring into draw attention to issues surrounding the shift from teaching to learning. The idea of a Personal Learning Environment recognizes that learning is continuing and seeks to provide tools to support that learning. It also recognizes the role of the individual in organizing his or her own learning. Moreover, the pressures for a PLE are based on the idea that learning will take place in different contexts and situations and will not be provided by a single learning provider.

Linked to this is an increasing recognition of the importance of informal learning (van Harmelen, 2006). Web 2.0 is the perfect platform to create these PLEs.

CoPs and PLCs could represent the classic view of learning help professionals collectively explore best practices. Many organizations use the learning management system (LMS) like Blackboard (Bb) or Moodle to create professional learning Communities. These communities can be structured, designed, and supported by the organization following Smith's classic view of learning. The PLC could be used to discuss a common scenario in the workplace that reflects conditions that exist in the workplace. This way everyone will share the same background and personal experience in the scenario. Then individuals can contribute outside knowledge gained from their collection of web 2.0 PLEs to apply to the "virtual problem" creating a powerful mix of formal and informal learning.

The literature recognizes that CoPs can be transformative, "capable of redefining the environment and direction of the organization" (Wenger 1998). There is research on transformational learning that suggests participants in multiple CoPs can integrate different transformations and concepts (Daugherty 2005). If professionals participate in PLC or CoPs as well as construct their own PLE using web 2.0 tools, this could help define best practices and support true transformational learning. PLEs, by themselves, do not represent a new practice in teaching and learning. But PLEs can enhance existing best practices and speed up the rate of transformation. (Attwell, 2006). This has the potential to create a blend of classic and official learning

Conclusion

Through history, learning processes (like art and literature) have been a reflection of the world, as it existed at the time. In early processes, learning occurred as life occurred – in communities where activity was part of work and processes were highly individual as each learner determined what was relevant to them. As the number of learners at any one time increased, the need to develop consistent, repeatable processes became necessary in order to make a national standard curriculum. The emergence of the Internet and its ability to deliver information on demand has led to an entirely new generation of learning tools such as Web 2.0 - web-based applications that enable anyone, anywhere, to access, interact with, and edit information in real time. As web-tools become more ubiquitous, hardware and software applications will be able to accommodate these tools without the need for costly upgrades.

With unbridled access to the Internet for information and learning, the challenge going forward for institutions and organizations will be in the development of procedures that will allow beneficial information “in” while preventing sensitive information from leaving institutions by way of security threats, both from within and outside the organization. In addition, research regarding employee productivity when there is no information filtering might be helpful, to determine if unrestricted Internet access during work hours is beneficial to either users or the organization.

Learning in the Information Age is no longer about “if” technology will be used; it is more about how to leverage technology in terms of time, cost, and benefits to everyone involved in its use. In learning, the goal is to use technology to foster interaction, relevance and deep engagement in both the information and processes that contribute to a more informed, productive global workforce.

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