Online Interaction Promotes Meaningful Learning with Technology

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Introduction

This paper supports the position that online interaction in Internet-based education, when designed and implemented correctly, promotes meaningful learning experiences. Meaningful learning is a relatively new term which occurs when the activity is active, constructive, intentional, authentic, and cooperative. The emergence of the Internet and availability of the personal computer (PC) propelled distance education (DE) into remarkable changes in the past several decades with the research of cognitive and learning styles; pushing DE to world-wide popularity. The development and rapid advancement of course management systems (CMS) have enabled the increase of online interactions (Wang & Gearhart, 3-6). These historic events changed the way we see teaching and learning (Simonson, Smaldino, Albright, & Zvacek, 230). Young people of today do not think twice about their daily check-ins to their e-mail accounts, chatting with friends across the globe, or checking the latest fashions online. They are accustomed to the instant gratification the Internet provides (Jackson & Helms, 7). In this paper, we will explore the world of Internet-based education and online interaction in relation to meaningful learning.

Meaningful Learning and Educational Theories

According to the authors of *Meaningful Learning with Technology*, meaningful learning occurs when students willingly engage in active, constructive, intentional, authentic, and cooperative activities (Jonassen, Howland, Marra, & Crismond, 2007, p. 2). **Active** (manipulative/observant) expresses that learning is a
natural process that man has always utilized to provide for their needs and improve their surroundings.
Humans learn by experimenting and manipulating their environment to discover “how things work” using tools and information available to them. Learning should be active not passive. Therefore teachers should be facilitators of instruction to help learners create a “knowledge construction environment” instead of simply accepting the knowledge passively (Chang, 1). **Constructive** (articulative/reflective) refers to the construction and development of mental models that explain what the learners observe combined with their experience and prior knowledge; with support and more thought process these models become more complex and meaningful learning begins (3). The **Intentional** (goal-directed/regulatory) component to meaningful learning directs that each action has a purpose (4). The activity is more effective when technologies are used to articulate and represent the learner’s understanding. **Authentic** (complex/contextual) indicates activities and tasks that are hands-on provide better learning opportunities than those that are abstract and do not relate to the learner’s real-world context. The final component to the meaningful learning process is **Collaboration** (collaborative/conversational) which involves working with others to encourage the thought processes in a knowledge-building community. Working in groups encourages expected social behaviors, respect of classmates, better understanding of the task, and problem-solving skills (5). Prominent uses of technologies for collaboration in an online environment include the discussion board, e-mail, instant messenger, chat rooms, and synchronous conferencing software applications (Roschelle, 9).

Meaningful learning with technology uses all the available tools combined with the best practices of contemporary educational theories to provide a positive, knowledge-rich, creative, collaborative, and attractive environment in which to enhance learning. It combines the best of the Progressivism, and Social Reconstructionism theories (or philosophical orientations to teaching) with heavy influences from humanistic psychology and constructivism.

Educational progressivism, founded by John Dewey (1859-1952), is the belief that education should be learner-centered, not teacher or content-centered and that education should be based on the principle that humans are social animals who learn best in real-life activities with other people. Progressivists claimed to
rely on the best available scientific theories of learning (Parkay, 87). Progressive educators believe that children and adults learn methodically as scientists do, following a process similar to John Dewey's model of learning:

- Become aware of the problem
- Define the problem,
- Propose hypotheses to solve it
- Evaluate the consequences of the hypotheses from one's past experience, and
- Test the most likely solution.

The concept of “learn by doing” by providing real-world experiences and activities that center on the real life of the students is taken from the progressivism philosophy (Farlex, 2008). These beliefs coincide with Bloom’s Revised Taxonomy (Fig. 1). The revised edition includes both the kind of knowledge to be learned (knowledge dimension) and the process used to learn (cognitive process). This allows the instructional designer to line up goals and objectives to assessment techniques.

Meaningful learning with technology also has characteristics of Brameld’s (1904-1987) Social Reconstructionism philosophy replaced the rote memorization component of progressivism, with active student participation (Schugurensky, 1). In essence, they believed that education should prepare children to be aware of current events and issues, encourage ethics and responsibility, problem-solving, and critical thinking skills (Parkay, 78).

Meaningful Learning is also based on the humanistic psychology and constructivist orientations. It emphasizes the personal freedom, choice, awareness and personal responsibility of an individual related to humanistic psychology (89) and focuses on processes of learning supporting student-centered curriculum involving active, meaning-making experiences (92). It supports that learning occurs in context and that learning is active and social (Driscoll, 1).

Internet-Based Distance Education

Today’s Internet-based courses incorporate many of the theories stated above. Many colleges and universities began to offer Internet-based courses to preserve resources and give more flexibility to students.
They wanted instructors to supply at least part of the course content on the Internet. This resulted in providing written lectures, tests and quizzes, class discussions, in-class exercises, and collaborative projects that encouraged an array of exchanges among students and instructors (Battalio, 339). The increase in online education is mostly due to institutional finances in that DE attracts learners from beyond the geographical boundaries of the school to bring in revenues and the ability to more sections of a course without having to use the classroom space. The expansion to online courses also caters to adult working students, offering flexibility and opportunity; overcoming circumstances that would otherwise prevent them from higher education (Dunlap, 20).

Advantages and Disadvantages

Hurt (2008) reported the results of her study in The Advantages and Advantages of Teaching and Learning Online, in which teachers were interviewed for their opinions of online teaching and learning. Advantages over traditional classroom courses were listed as: increased systematization of learning content; offered more interaction; beneficial use of technologies; learner accountability; development of time management; enhanced writing and computer skills; more motivated learners; more opportunities for professional development; and more flexibility. It is important to note that most of these advantages benefited the students as well as the teachers.

Disadvantages listed were: potential isolation due to lack of face-to-face contact; increased plagiarism; slower connection speeds for students using dial-up; decreased enrollment of seated courses; lack of technology skills of students and instructors; and increased work load for instructors. The reflected opinions were that the advantages of online learning outweighed the disadvantages and for each detriment, there was a feasible answer (Fig. 1). All instructors but one said they would teach another online course (Hurt, 10). Similar studies have supported these findings which corroborate the increased popularity of online learning (Kehrwald, 99; Ikpeze, 401; Seok, 192-193; Moore, 25).

So, do all online courses possess the same quality of instruction and design? Absolutely not! Research has repeatedly indicated that many factors must be considered in the instructional design of online learning and failure to do so results in the dissatisfaction of instructor and student. According to the theory of transactional distance, Moore (1997) supports the idea of having an array of course formats available to
learners. He believes that fluctuations in the amount of instructor-student interaction and structure will vary depending on the course subject and needs of the learners. Course planning is therefore essential to ensure the design and interactions are adequate and correct for each learner (Battalio, 347).

**Instructional System Design for Internet-based Learning**

Instructional System Design (ISD) is not new but like our education systems it has grown and developed to incorporate the changing needs of students, advancing technologies, and compliance of state and national standards. A goal-driven process, ISD strives to produce effective and efficient instruction in an effort to balance objectives, content, assessment, and instructional strategies (Biswalo, para.19). Popular educational theories have combined with the knowledge of available technologies to contribute to the best practices of instructional design for online learning.

**The Importance of Planning**

A systems approach to DE considers the components involved and how they interrelate with each other. It also weighs the importance of each element. This approach is essential because these elements work together to create an effective learning environment. Student-teacher support, student-student support, interaction methods, content delivery methods, communication, and evaluation strategies are only a few of the critical components. Because the instructional design must consider the learners' needs, learning abilities, styles, and emotional well-being, a systems approach helps to organize and include all possible situations and scenarios involved. This specific approach can help target the group of learners involved (Biswalo, 2001), and requires a needs analysis, learning objective specification, development, implementation, and evaluation (Wang, 15).

**Online Interaction and Interactivity**

Interaction is known as the key to success in learning. Cognitive, affective, and social effects are all considered to relate to interaction and are necessary for the learning process to take place. An essential component of learning involves interactions with non-human and human sources. We do not live in a vacuum. We are constantly interacting with our surroundings. Interactivity (in education) refers to the interaction between the “learner and instructional content” (Wang & Gearhart, 97). For distance learners,
this contact occurs with the course management system or other user interface used by the educator. Communication is commonly through asynchronous print or digital form like electronic discussions. Asynchronous means there is a delay between contributor interactions and the use of an interface instead of voice, as the way feedback is given and received (117).

Overcoming transactional distance requires the following elements:

- Specific instructional interventions;
- Facilitator attention to a number of roles
  - Pedagogical, helping students during learning processes
  - Social, developing a safe learning environment,
  - Technical support and
  - Administrative

The instructor needs proper training to teach online so that the transactional distance does not hinder the learning of the students.

*The Learning Environment*

In this age of information and technology, the rapid advancements are almost mind-boggling. Technologies are out-of-date by the time they reach store shelves. The function of a learning experience, online or face-to-face, is to achieve certain learning objectives which must be “more structured and systematic” (Garrison & Cleveland-Innes, 134). Development of Course Management Systems (CMS) such as Blackboard™, WebCT™, and Desire2Learn™, and teleconferencing applications like Eluminate™ have enabled quality learning experiences and opportunities to students of all ages across the globe. The basic components used for interaction and interactivity are consistent in these applications and include: course management tools such as syllabus, calendar, announcements, and assignment descriptions; communications through e-mail and discussion boards, learning-content presentations, group space, assessments, assignment submission capabilities, evaluation tools, quizzes and tests, and system statistics (Smith, 322). The use of these components varies from course to course just as the instructor’s preferences vary, but studies have shown that students like online learning. Based on results of a study conducted to determine if Internet chat
can provide meaningful experience, it was found that it has the potential as a “motivating learning tool”. In fact, most in the study preferred the interaction of Internet chat to face-to-face discussions (Jarrell, 59). Curtis’ (n.d.) study of conversations in chat room discussion groups illustrates (Fig. 3) students connect with each other to create authentic social interactions to negotiate their own understanding of course content that supports meaningful learning (Curtis, 147). It was also crucial for the learning environment to be comfortable and to enhance the value of electronic discussions with prompt feedback and instructor-involvement (Sargeant, 128).

Successful Online Learners

At the end of the working day, the learner signs in to his online course and prepares to enter a virtual world. Studies and research help us learn about the characteristics that create successful online learners. The differences considered relate to each student having individual learning and psychological needs. Knowles (1984) wrote about his Androgogical model which described adult learners as motivated and self-directing. They have a rich reservoir of experience and knowledge to draw from and a problem-centered approach to learning. He also believes that recognizing these characteristics and principles help adults to develop useful strategies to fill their educational needs (para. 9). Knowles’ (1984) theory of Andragogy emphasizes that learning should be relevant and learners must be motivated to learn to be successful (Kearsley, Androgogy; M. Knowles). Cross’s (1981) Characteristics of Adults as Learners (CAL) model integrates the Androgogy (Knowles) with experiential learning (Rogers, 1969) and lifespan psychology. The CAL model considers aging, life phases, and development stages in the class of personal characteristics and the class of situational characteristics relate to whether the learner is studying full or part-time and if the learning is required or voluntary. According to Biswalo, all these variables affect the educational needs of the adult learner and must be considered in the design of the learning environment (para. 11). He also notes that using technologies in the promotion of learning, acknowledging the strengths and weaknesses of each, can add to the learning environment (para. 12). In fact, students’ meaningful learning through interactive applications can only be achieved when adequate support, clear vision, and strategies for online education are maintained; providing faculty support, and assessment and evaluation (Yoon, 26).

Assessment for Online Learning
As part of the evolution of education, assessment must too change. The switch from traditional rote memorization and drill and practice to more meaningful learning experiences must also include more creative forms of assessment. We can refer to Bloom’s Revised Taxonomy (2001) as a guide for assessment (Dunlap, 7). Numerous forms of assessment associated with course objectives should be used to measure learners’ assignments and participation (Wu & Chen, 5). Weekly assignments related to text and article readings require multiple postings on the discussion board to take the place of real-life discussions. Collaborative projects assigned to small groups facilitate active learning. It is essential that the instructor state clear expectations and detailed assignment instructions accompanied by grading rubrics to help students know what is expected (Simonson, 266).

The tricky part is to find ways of teaching so that students gain understanding and knowledge from the concepts presented, and at the same time develop ways to assess their level of understanding. Assessments should be created during course planning so that they link directly to the learning goals and objectives of the course (264). The ideal is for the student take which is learned and gain understanding of the concepts; to transfer the knowledge and be able to apply it in other situations. Making the experience meaningful, active, authentic, and intentional helps achieve that goal. Creativity is not just for art and music. It should be used for every subject to make lessons more real-life and meaningful for the students with the goal of engaging them.

Conclusion

This paper has provided research and documentation to confirm that online interaction promotes meaningful learning with technology. Today, technologies are used as supports and facilitators of thinking in a learning environment which encourages learner-teacher, learner-learner, and learner-content online interaction. These interactions require learners to use causal, analogical, expressive, experiential, and problem-solving for assignments, activities and tasks. “Technologies can support meaningful learning when students learn with the technology, not from it” (Jonassen, 10). Using the learning environment interface, the learner accesses information, investigates, explores, writes, builds models, builds communities, communicates with others, designs, and visualizes; engaged in deeper levels of thinking and reasoning (10).
References


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**Figures**

Fig. 1. *Bloom’s Revised Taxonomy Chart is shown here in chart form showing the Knowledge Dimension in the far left column and the Cognitive Process Dimensions of Remember, Understand, Apply, Analyze, Evaluate, and Create in the columns to the right.* This chart was designed to be use by educators in lesson planning to develop goals and objectives for the learning content being presented.
Fig. 2. **Summary of Cited Advantages and Disadvantages of Online Teaching: Number of Comments charts the responses from teachers polled in a study conducted by Joyce Hurt (2008).** The results reflected the opinion that the advantages of online learning outweigh the disadvantages and for each detriment, there was a feasible answer. All instructors but one said they would teach another online course.

Fig. 3 **Percent in Various "Feedback from Peers" Subcategories illustrates the topics of discussion in the chat rooms by the students in the study and the percentage of each.**

*Figure 1 Revised Taxonomy Chart (Cruz, 1)*

*Figure 2 Summary of Cited Advantages and Disadvantages of Online Teaching (Hurt, 11)*

*Figure 3 Percent in Various "Feedback from Peers" Subcategories (Curtis, 145)*