The Invisible People:

Educational Technologists- Do We Exist?

Dean Caplan
Graduate Student
Educational Communications and Technology
University of Saskatchewan

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Abstract

This paper will look to understand the functions of the professionals in Educational Technology from its beginnings up to today. As Educational Technologists, does our own lack of definition for what we do contribute to a lack of understanding by the public? If so, how does this affect what we do?

Part 1 presents a brief history of the field. Part 2 explains job descriptions and some resources for finding work in the profession of Educational Technology followed by a summary conclusion.

It would seem logical at the beginning of a discussion about Educational Technology to present a definition of it. Indeed, there have been many definitions suggested based on many issues and much research, and yet ET suffers from an identity crisis. Is it a process? A product? The point of this paper is not to attempt to write the ultimate definition, but rather to try to understand the scope of Educational Technology as a process, based on what its practitioners literally do. A complete understanding must begin with a brief description of what its practitioners have done in the past.

Part 1: A Brief History

If a generic view of technology is taken, it could be argued that whenever a systematic plan is developed and carried out in order to successfully communicate facts, ideas, beliefs, behaviors, or knowledge, the process of educational technology has occurred. Although technology must have been taking place since the beginning of time, general recognition and documenting of it in education began in the 5th century B.C. with the Elder Sophists.

The Elder Sophists were a group of ancient Greeks who believed that knowledge helped society evolve slowly but progressively toward an egalitarian and democratic state where morality and law were determined by societal consensus, rather than divine authority or a priori absolutes. The Sophists were first to use the teaching technology of group discussion or

"Sophistic dialogue".

The Sophistic methods influenced European education until the 11th century when Abelard's Scholastic method was developed. At this time, society was becoming generally more skeptical and less willing to accept things at face value, especially in the area of religion. Abelard felt any subject or thought could be analyzed for the purposes of understanding, verification, or qualification so he developed 158 questions about theological writings and a procedure for analyzing the material. The Scholastic method, later revised by St. Thomas Aquinas, was an inquiry method where the learner continually questioned material and postulated theses which could then be proven or rejected.

In the 17th century, the technological advancement of the printing press affected educational technology by shifting theories of education toward empiricism. Johann Comenius' *Orbitus Pictus* was the first use of a printed book to help teach. This is perhaps the beginning of the confusion between ET as a process and ET as a medium. Comenius designed his book as an instructional aid to help sequence content from simple to complex, according to the natural stages of development of each learner, a theory which was reiterated in the 18th century by Jean Jacques Rousseau's educational essay Emile.

Later in the 17th century, John Locke's *tabula rasa* (blank slate) theory proposed a shift in instructional beliefs, seeing the process of learning more akin to habit formation than as an intellectual exercise. Locke's theory could be seen as a forerunner to B. F. Skinner's behaviour modification theories, appearing almost two hundred years later.

Around the beginning of the 1800's, two significant educational developments occurred in Germany. The first systems approach to instruction was designed by Johann Friedrich Herbart as a four step learning plan:

> Herbart's discussions of how sensory information was transformed, organized, stored, and related to new experiences were unique and laid the foundation for a modern psychology of perception. (Saettler 1998 p.52)

Around the same time as Herbart another German named Friedrich Froebel presented his philosophy that education should nurture children's growth of creativity, socialization, self-motivation and activity, and motor skills. Froebel developed the *kindergarten* system to address these goals, comparing the educator's role to that of a gardener.

One of the first influential works linking education with science was the 1886 *Teacher's Handbook of Psychology* written by James Sully of Scotland. He believed that successful instruction should take into account the general nature of psychological principles and systematically apply them in practical ways.

At the turn of the twentieth century the pace of educational technology, as with technology in general, began to quicken yet many of the theories put forth in the last hundred years are deeply rooted in the past.

The main principles of Maria Montessori's methods of the early 1900's included adapting and sequencing content for each individual learner and complete freedom for learners with an

emphasis on education through all the senses. The following decade witnessed the work of Edward Thorndike. Thorndike purported that schools should provide experiences that "pursue prespecified, socially useful goals" (Shrock 1995), a philosophy that was furthered by others such as Franklin Bobbitt, and Mary Ward and Frederic Burk whose instruction plan of the early 1920's at San Francisco State Normal School was one of the first to be characterized by clearly pre-defined objectives and individualized instruction. Later in the United States two associates of Burk's, Carleton Washburne and Helen Parkhurst, established the *Winnetka Plan* and the *Dalton Plan* respectively, which also centered on objective driven, mastery learning using self instructional materials allowing students to work at their own pace with minimum teacher direction. These early plans of the 20th century influenced the work of Skinner and his famous "Skinner Box" of the 1950's.

In 1933 Ralph Tyler, while working on a study from Ohio State University, developed a method for measuring the effectiveness of the intended learning outcomes (objectives). Tyler qualified these outcomes based on students' behavior thereby created the behavioral objectives that are used today in instructional design. Tyler also made another contribution to modern day instructional design methods. He used the results of his behavioral objective assessments to continually revise the curricula of the study until desired achievement levels were attained -- what we now call on-going or *formative evaluation*.

The onset of World War II introduced a huge instructional problem: how could thousands of military personnel be quickly and effectively trained ?The answer at the time was an enormous global influx of mediated learning material: film, slides, photographs, audio tape, print material, and more. As a result a need was created for professionals with expertise in education to work with subject matter experts and media producers to help create the materials and oversee their implementation. The war experience raised the profile of mediated education showing the world what could be achieved with well funded research and development efforts in education. Critics, however, asked the question whose answer seems to be as far away now as it was then: "Was the war training effort simply using sophisticated media to deliver unchanged instructional strategies, or did the design and implementation of the mediated learning itself signal an advancement in educational technology?"

The end of World War II does not bring the history of educational technology quite up to date but from this time on there seemed to be a polarization of the field into two camps: the practical based audio-visual camp and the other more theory driven camp who followed a more scientific, systems approach to education. Both philosophies found acceptance and prospered even though they seemed to directly contradict each other. Audiovisual instruction, exemplified by the emergence of television, targeted a mass audience while programmed learning was designed specifically for individualized instruction. But in the 1960s the American Department of Audiovisual Instruction (DAVI), under the leadership of Dr. James Finn, published several seminal works in attempts to progress the Audiovisual field past a simple focus on products and toward including systematic design and assessment principles in the development of those products. In his forward to one DAVI publication, *Teaching Machines and Programmed Learning*, Finn states:

> ...the audiovisual professional, as a technologist of the teaching

> profession, must relate to fields like psychology exactly as the medical doctor relates to his basic sciences. (Finn 1960)

The editors of Teaching Machines and Programmed Learning , Robert Glaser and Arthur Lumsdaine, agreed:

> It seems to us that numerous contributors whose writings have produced this volume have reflected one dominant idea.This is the concept that the processes of teaching and learning can be made an explicit subject matter for scientific study, on the basis of which a technology of instruction can be developed. (p.563)
> ...As we learn more about learning, teaching can become more and more an explicit technology which can itself be definitively taught. (Lumsdaine and Glaser p.564)

> The basis for consistent improvement in educational methods is a systematic translation of the techniques and findings of the experimental science of human learning into the practical development of an instructional technology. (Lumsdaine and Glaser p.572)

Later publications of the DAVI confirmed the push toward a merging of the audiovisual and theory based camps. 1963's The Changing Role of the Audiovisual Process in Education: A Definition and a Glossary of Related Terms defined audiovisual communications as:

> (a) the study of the unique and relative strengths of both pictorial and nonrepresentational messages which may be employed in the learning process for any purpose; and (b) the structuring and systematizing of messages by men and instruments in an educational environment. These undertakings include the planning, selection, management, and utilization of both components and entire instructional systems. (DAVI 1963)

As we follow the history of ET it is clear that many changes have occurred yet similarities in general philosophies of education can also be seen carried over from one century to the next and spreading around the world. In North America in 1971 DAVI changed its name to the Association for Educational Communications and Technology (AECT) to reflect changes in its perspective of the field of Educational Technology. Although efforts of the AECT and others to merge practical and theoretical viewpoints have helped create a paradigm shift in ET practice over the past 30 years, there still remains clearly drawn lines and resulting communication gaps between proponents of each philosophy.

Part 2: What Do We Do?

As stated earlier many studies have been done attempting to build a definitional framework of Educational Technology within which all of its related tasks, functions and products could fit.

Since World War II ET has become recognized as a legitimate profession in countries all over the world, with professional organizations started in many countries on almost every continent. But as cultures differ among these countries, so too does each culture's perception of education and what purposes Educational Technology should serve. Terminology and job descriptions vary greatly from one country to the next and sometimes even within one country or region. As a result there is still no universally accepted definitive framework.

In North America the AECT has taken on the responsibility of defining ET for the past 35 years. As technology has changed the AECT has revised its first definition from 1963 three more times: 1972, 1977 and 1994. This fact alone shows how difficult it seems to "hit a moving target". Following are some of the findings from the last report of the AECT Task Force on Definition and Terminology.

It was found in the past that many members of the field used the terms *educational technology* and *instructional technology* interchangeably. However, more professionals now use *educational technology* in a general sense to describe any use of technology in an educational endeavor while *instructional technology* has more to do with direct application of technology in the acts of teaching and learning. In other words, instructional technology is a sub-category of educational technology. In business and industry, and military sectors the term *performance technology* has come into recent use as a synonym for instructional technology.

In order for practitioners to identify their role in ET Seels and Richey (1994) broke the field up into five "domains" with specific areas of practice in each. (See Figure 1 below). It was reported that practitioners rarely performed only one duty and that there was often much job interaction among all domains, i.e. someone working as an instructional designer may also be managing a project and/or developing computer based lessons.

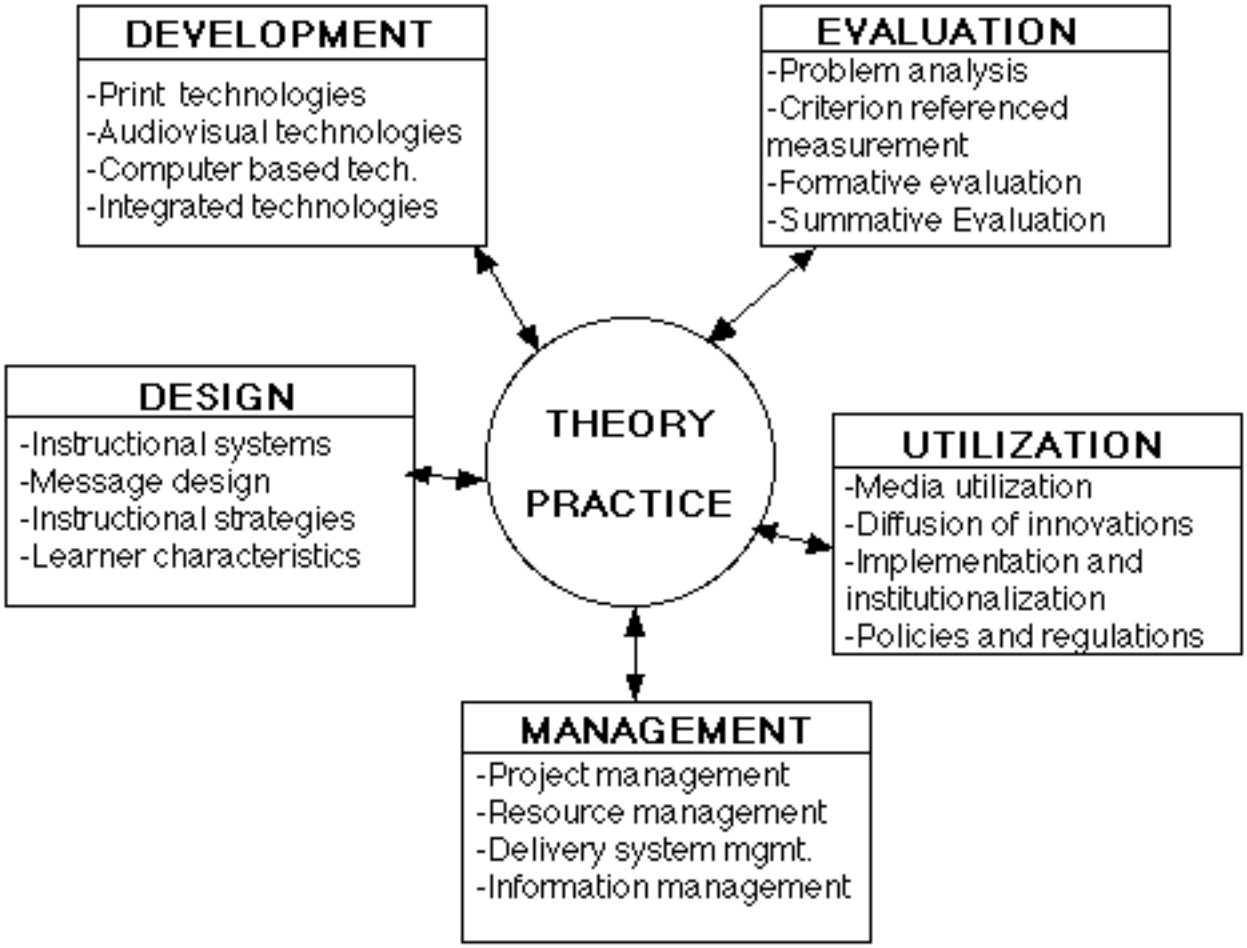

FIGURE 1
The domains in ET
(Seels & Richey 1994)

Within these domains are a variety of work settings. More educational technologists are employed in school settings than in non-school settings but this is changing as business and industry come to terms with global competition and the need to keep employees on the leading edge of new information and techniques. ETs are also finding work in tertiary sectors such as the military, government work, design and evaluation in non-profit organizations, and in health related professions.

The following is a list of job titles and general descriptions of related duties that are consistent in the literature. It is by no means to be considered complete, but is to give a general idea of some terminology and employment contexts.

Instructor	usually classroom teachers or professors. Responsible for developing and presenting courses in school or training settings.
Media Specialist	provides support in production and use of audiovisual materials, maintenance of equipment and analysis and design of usage contexts.
Librarian/Information Specialist	selects, purchases, classifies, catalogs and retrieves materials, and locates instructional and research materials. In school settings this job may entail some instruction or administrative duties.
Computer Specialist	responsible for planning, installing, and maintaining computer hardware and software systems, network installation and maintenance, support, development and implementation of computer based programs, and instruction.
Instructional/Curriculum Designer/Developer	may perform one or several functions of instructional systems design including needs assessment, identifying objectives, scope , sequence and strategies of instruction, course development, instruction and administration.
Distance Education Specialist	develops courses for delivery by distance, develops materials, analysis and design of usage contexts, knowledge and support of technical issues, instruction.
Consultant/Researcher	may perform any of the above duties, give professional advice and support, carry out research and investigation.
(Multi)Media Producer	plans and develops material for educational, training, entertainment contexts using one or many media.
Administrator	manages the overall organization of a project or a department, human resources duties, reports progress to clients, manages other resources, systems, etc.

As you can see, one advantage to the flexible boundaries of Educational Technology is that there are many different types of related employment however many of the positions in ET require graduate degrees perhaps due to high levels of specialty. Aside from the traditional means of job searching (newspapers, professional publications, etc.) looking for employment on the Internet has helped make the job hunt easier. Joining professional organizations and becoming active within them is suggested as well. Below are some World Wide Web sites that

contain job openings or links to job positions in the field of Educational Technology.

ET Jobs on the Internet:

http://www.AMTEC.ca/

http://www.AECT.org

http://itec.sfsu.edu/jobs/eductech.html

http://chronicle.merit.edu/.ads/.ads-by-group/.faculty/.sscience/.ity/.links.html

gopher://sunbird.usd.edu:72/11/jobs

http://www.tcm.com/hr-jobs/

http://agora.unigech/tecfa/edutech/welcome_frame.html

http://www.nerdworld.com/nw1077.html

http://www.ac.com/

http://www.arthurandersen.com/homepage.htm

Conclusion

Most people do not understand the role of practitioners of Educational Technology. By definition, technology causes change to occur and ET is no exception. Despite the fact that our work is often overlooked, misunderstood or not even considered often by those who would seem to benefit from it the most, these attitudes seem to be changing. Slowly. The best way for us to make ourselves known is by our work It is likely that our roles will not soon become more explainable because we areworking in a world that is constantly changing and in order to be effective we must be always riding the crest of change. Like the product of our labors, we will know we have succeeded if no one knows we were there.

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