The Journal of Applied Instructional Design

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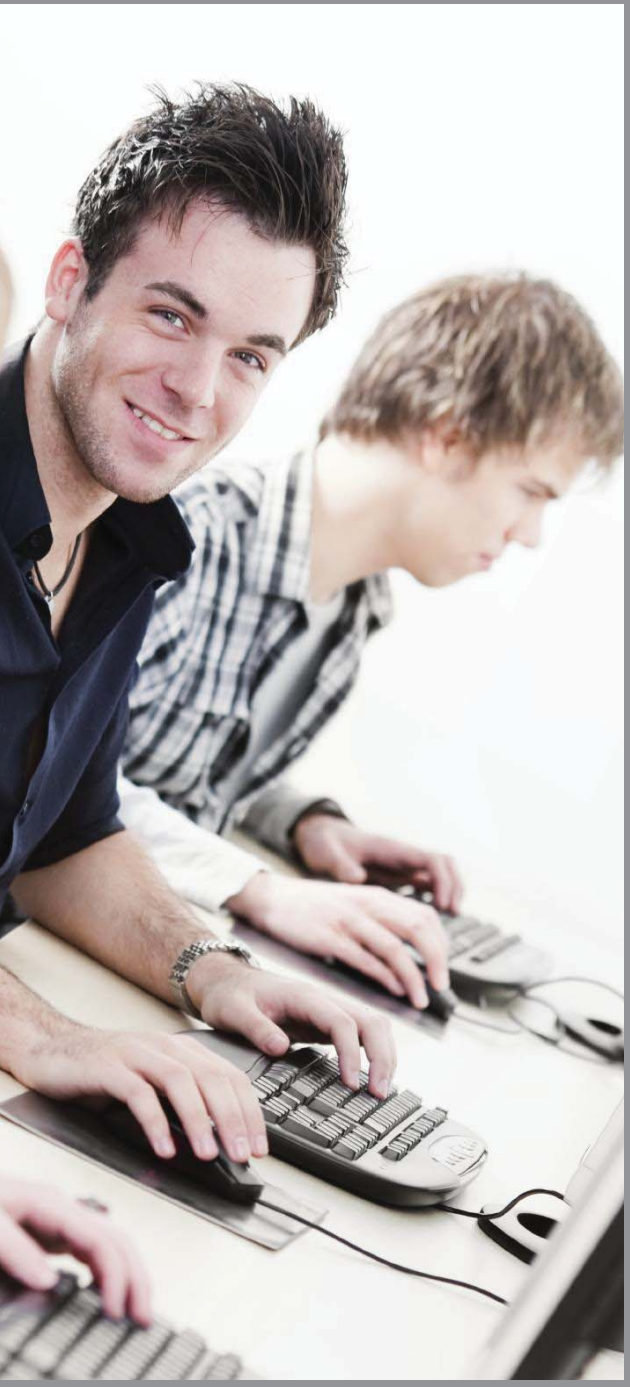

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About

The Journal for Applied Instructional Design

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The purpose of this journal is to bridge the gap between theory and practice by providing reflective scholar-practitioners a means for publishing articles related the field of Instructional Design.

JAID's goals are to encourage and nurture the development of the reflective practitioner as well as collaborations between academics and practitioners as a means of disseminating and developing new ideas in instructional design. The resulting articles should inform both the study and practice of instructional design.

JAID is an online open-access journal and is offered without cost to users.

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2011 AECT International Convention

Celebrate 3.0: Design.Learn.Community

AECT's Annual International Convention
November 8-12, 2011
Jacksonville, Florida

This year's convention theme is Celebrate 3.0:

Design.Learn.Community. The rapid evolution of Web 2.0 technologies has generated a level of communication and interaction never before possible. In response, AECT 2011 seeks to explore the transformational potential that these innovations hold for education, as well as share current research and best practices related to these developments.

HIGHLIGHTS!

Tuesday, November 8 – Pre-convention Workshops, Bus tour to St. Augustine, the nation's oldest permanent settlement, features magnificent attractions and historic landmarks at virtually every turn.

Wednesday, November 9 – Pre-convention workshops, two-hour Walking Tour of Jacksonville, morning tours to the Sally Corporation, a Jacksonville-based company that specializes in animatronics. The Ritz Theatre and Museum which celebrates the rich legacy of Jacksonville's African-American community. Opening General Session (4:45pm-6:00pm) and AECT Welcome Reception. (6:00pm-8:00pm)

Thursday, November 10 –Breakfast with Champions, Concurrent Sessions, 2ND General Session, Affiliate Reception, Annual International Dinner and Auction,

Friday, November 11 –Concurrent Sessions, AECT Member Meeting, Joint University Reception, AECT Party at the Landing, 8pm (still tentative)

Saturday, November 12- Concurrent Sessions, Post Convention Workshops, Tours scheduled to the World Golf Hall of Fame and the IMAX Theater, "or" a half day of shopping to the St. Augustine Premium Outlets.

With Scholarship and Practice in Mind: The Case Study as Research Method

Paula Dawidowicz, Walden University

Abstract: Unlike theoretical scholars who seek knowledge to expand humanity's (or their) understanding of a topic, scholar practitioners seek knowledge that can be applied to understand change or create change in a specific phenomenon. Although many of the same research methods can be used by both groups of educational scholars, and although research designs are determined in large part by the research questions being asked, several research methods can prove most useful for scholar practitioners examining learning environments. One, the case study, stands out as perhaps the most versatile and researcher-friendly, though. A case study, bounded by specific location and topic parameters, can allow solid evaluation of the workings of a program or teaching method. It can also allow consideration of specific needs to address an educational situation. This article briefly discusses the nature and purpose of different types of research, then focuses on the nature and usefulness of the case study methodology.

Keywords: case study, practitioner research, evaluation, program evaluation

The point of research for an instructional design scholar-practitioner is not to discover knowledge in a vacuum for the sake of having that knowledge. It is to gain knowledge to create change in instructional design—to develop better programs, identify student needs, determine the usefulness of an intervention, or understand some other aspect of instructional designs in relation to educational environments. As such, instructional design researchers attempt to gain a clear enough picture of what is occurring related to a specific design to be able to draw logical conclusions about instructional design activities.

For the scholar-practitioner determined to make the most of time and resources, a number of research methods are available, all of which offer both benefits and drawbacks. Quantitative research, examining specific relationships between variables or the causality of a specific effect through the testing of one or more hypotheses, has stood the test of time—but is most often used at the culmination of an in-depth research agenda that has involved previous explanatory and exploratory research in some form. Survey research, sometimes used in quantitative analysis and sometimes used descriptively, allows researchers to gain a concept of the environment (people, circumstances) related to the phenomenon they are studying. Mixed methods research, a quantitative-qualitative research hybrid, allows researchers to gain generalizable and in-depth insight through analysis of a small portion of quantitative data and a small portion of qualitative data which, because of the design's nature, must address tightly focused questions about a narrowed aspect of a phenomenon in order for researchers to maintain design integrity. Qualitative research, limited in some researchers' eyes by its lack of generalizability, offers researchers the flexibility to gain exploratory and explanatory insights into numerous questions that could not be answered effectively using quantitative or mixed methods designs.

Why Choose a Case Study?

Among what are perceived as the qualitative research traditions, case study provides the most flexibility for researchers conducting everything from program evaluations to exploratory resource examinations to even people's perceptions of their needs in specific situations. To illustrate, case studies have been used to examine the development of cultures (Doron & Rehay, 2011), to explore effective reporting of results to audiences (Greer, 2010), and evaluate methods for teaching ethics to public health students (Howard, Lothen-Kline, & Boekeloo, 2004). For instructional design researchers in particular, Uribe, Klein, & Sullivan's (2003) examination of the application of transferability problems with computer-mediated collaborative learning provides a good example of the flexibility and usefulness of a case study design.

Concerns Regarding Case Studies

Case studies are often misunderstood and, because of those misunderstandings, undervalued and under used by researchers. Today's research landscape tends to be riddled with judgments about the superior value of different types of research methods (Miles & Huberman, 1994). The decades old debate of whether quantitative research—more objective and applicable to a larger population—is more useful than qualitative research—focused on rich description of processes and reasons for people's actions—has been joined by a third methodological design, mixed methods, which combines the two. In the heat of this three-philosophy research debate, it appears that the value of the versatile case study may have, for many, gotten lost (Plano Clark & Creswell, 2008). Ironically, Tashakkori and Teddlie (2010), prominent in the development and refinement of the mixed methods methodology, have stated that case studies are prime examples of the fact that mixed methods studies are not – in fact, should not be – placed on the design terrain but, instead, "entail or privilege a particular design" (p. 241). In either case, the research landscape continues to evolve, providing increased research design choices to researchers and, in the process, increasingly eclipsing the potential values of qualitative research and case studies in particular.

Case studies provide a venue for researchers to expand their understanding of phenomena and explain the phenomena's landscapes and development in specific bounded cases, including why different previously tried instructional designs did or did not work (Bouck, 2008). They also allow evaluations, summaries, and conclusions about designs and interventions that can allow researchers to hone phenomena's useability and value in multiple situations (Hrabe, 1997). However, since case studies rely on inductive reasoning to gain transferability (not generalizability) from the examined data, researchers do not always value case study designs (Merriam, 2002; Stake, 2006; Yin, 2009).

This use of inductive reasoning, as well as several other factors, have influenced some researchers to avoid using the design for fear their own research results may be called into question. First, research consumers may be concerned that the researchers conducting a study may not have been meticulous, concerned instead with interpreting and presenting data skewed to their own purposes rather than objectively (Yin, 2009). Further, as previously mentioned, researchers using case studies gain in depth knowledge about a given bounded case because case studies are "immersions into one real-life scenario" (Tashakkori & Teddlie, 2010) and "particularizations" rather than "generalizable" (Stake, 2006). However, this lack of generalizability can be seen as a weakness rather than a strength by some researchers, creating frustration for them when they hope their studies' results will identify a "right" answer or conclusion (Yin, 2009). In addition, the length of time researchers may need to conduct a case study and the sheer size and complexity of data acquired can also concern researchers and dissuade them from considering conducting such studies valuable in relation to other research designs. Finally, the emphasis in education research on the establishment of causal relationships has created a blind spot in researchers who do not recognize that case study research can fill gaps in understanding about reasons for causality that may be unexplainable through an experimental or quasi-experimental study (Yin 2009).

Benefits of Case Studies

One value of case studies is that, although often considered a qualitative research design, such studies can actually involve the use of either quantitative or qualitative data or both. Although quantitative data are often analyzed in case studies only as descriptive statistics, that is not always the case and certainly does not have to be the case. With that kind of flexibility, researchers can adjust case studies to effectively address a myriad of research situations. Quantitative data sources—designed to include raw statistical comparisons rather than specific predictability relation-

ships—can provide clear snapshots into the numbers related to results—results teachers, a school, or a district achieve with incorporation of a specific design aspect into the curriculum (Showler, 2000). On the flip side, qualitative data sources—designed to gain insights into why, how, or under what circumstances a specific event occurs in relation to a phenomenon—can provide insights into under what circumstances those results will likely occur again (Küçük & Çepni, 2005). Studies that combine both aspects, when the questions to be answered require it, can provide comprehensive insights into both the what and the how, when, where, or why (Teddlie & Tashakkori, 2009). In addition, this use of broad, multiple data sources that is a hallmark of qualitative research designs allows researchers to gain in-depth knowledge about a given bounded case—its circumstances, particulars, results, and impact (Merriam & Associates, 2002; Stake, 2006).

Perhaps equally valuable is the ability to conduct comparative and multiple case studies, as described here. By combining data collected from several locations—several classrooms or several schools, for example—researchers can gain a clearer picture of a phenomenon [loosely equated to what Stake (2006) refers to as a quintain]. Because this type of study involves a larger total amount of data, as well as illustrations of how the phenomenon occurs in different cases, the total picture developed provides greater insight into the utilization variations that occur so that the overall results are more transferable (Stake, 2006; Yin, 2009). Even better, researchers can build studies to specifically compare aspects of implementation of a program or process in two different locations to identify, through comparison and contrast, the strengths and weaknesses of different aspects of the program and how it is implemented in different circumstances. A good example of such a use is Zolla's (n.d.) study examining different information technology diffusion implementation methods.

That said, if someone wrote a commercial about case studies, it could sound like television commercials for the "incredible, edible" egg—multiple uses and an unstoppable tool in the researcher arsenal. Case studies can be used to define both the importance and impact of immediate interactions between different groups, roles, instructional designs, or other factors in specific situations, depending on study research questions. This is in part because case studies provide a structure for unobtrusive but effective researcher-negotiated participation in a specific community to allow optimal data collection. They also provide researchers the flexibility, when appropriate, to take advantage of hindsight—analyzing the effects of the passage of time—and applying those data to the present (Guba, 1990; Merriam, 2002).

Case studies yield thick, rich descriptions of the phenomena being researched, highlighting in the process the many complexities of a situation and the factors that can contribute to those complexities (Howard, Lothen-Kline, & Boekeloo, 2003). As a result, researchers can identify the influence individuals have on issues, including differences in attitude and how differing attitudes may have impacted overall results. Using a wide variety of data sources, among which can be test scores, observations, interviews, and newspaper articles, researchers using a case study design can gain a comprehensive view of deep factors involved in the phenomenon they are studying (Merriam, 1988; Yin, 2009).

Case Study Approaches in Education

Often researchers attempt to define case study research based on what they perceive as the design's uniqueness. However, case studies should not be defined by the methods employed but, rather, by the questions a researcher asks and the research gap researchers are attempting to fill. Case studies' findings are more concrete, more contextual, more developed by readers' interpretations, and based more on reference populations as determined by readers (Merriam, 1988; Nachmias & Nachmias, 1976).

Case studies have certain essential properties. Along with being particularistic and inductive, they are also descriptive and heuristic. They are almost never used to test theories but, instead, to build case study propositions (Yin, 2009). Proposition development, begun as researchers inductively develop the direction they take in a study (rather than deductively presupposing a hypothesis and testing it during the study), continues throughout the study and is completed only when final study conclusions are drawn (Guba, 1990; Merriam, 1988). They emphasize the process-product approach, the emphasis of illustrations or exemplars, compromises and fusions to combat the differing constraints of both generalizability and case specifism, and a series of contextualizations (Fowler, 1988; Guba & Lincoln, 1988; Hammersley, 1995; Hedrick, Bickman & Rog, 1993).

They can contextualize to accommodate political and social contexts and value-free understanding of the social world, control, social engineering, to advocate the underprivileged, and to affect given processes and human interactions by heightening their awareness of individuals. They contextualize to either verify data gathered by review or input from the individuals being studied, to gain subjects' buy-in on changes suggested by study conclusions through periodic subject input and review, and to create an educational revolution that changes, through collective action, the nature of education itself (Firestone; Fowler, 1988; Guba & Lincoln, 1988; Hammersley, 1995; Hedrick, Bickman & Rog, 1993).

A Moment for Epistemology

A number of epistemologies (research perspectives) commonly drive case studies. Some case studies are quantitative (Yin, 2009) and, as a result, utilize straightforward epistemologies. The majority of case studies, qualitative, are so impacted by researcher epistemologies that understanding the perspectives researchers conducting case studies might apply proves important. Four good examples are provided here briefly for consideration. Postpositivism can be thought of as social engineering, designed to create an appropriate or effective societal structure where reality is what works or what can be verified, knowledge is small, and truth is a relative idea. Constructivism can be thought of as storytelling, where researchers attempt to paint a picture of what life is about—a social and multiple construct where time does not stop and knowledge is drawn from a consensus of individual perceptions, meanings, and underlying values in relation to a specific phenomenon. Critical theory can be thought of as social activism, where researchers attempt to inspire members of underprivileged or disenfranchised groups to work to affect change and strive themselves to both discover knowledge and enact what is good or right (Guba, 1990).

Most education case studies use constructivist frameworks, attempting to portray and interpret the intersubjective meanings used in culture, language, symbols, and human organizations. They are nonfoundational, growing from the concerns of the paradigm represented in the phenomenon they are investigating and present multiple, holistic, competing, and often conflictual realities of multiple stakeholders and research participants rather than using abstraction (reduction) or approximation (modeling) of a single reality. Researchers conduct analysis using axiomatic criteria (displaying resonance with constructivist inquiry), rhetorical criteria (relating to the form and structure, or presentational characteristics, of the written document issuing from the inquiry), or action criteria (demonstrating the case study's potential to evoke and facilitate action from the readers). These criteria serve either as empowering for individuals (providing a structure for the analysis) or as transferability criteria (Guba & Lincoln, 1988; Merriam, 1988). The resulting research conclusions can either be grand, midrange, or substantive. Grand conclusions attempt to explain large categories of phenomena and are most common in the natural sciences. Midrange conclusions address one conceptually abstracted area of human experience and emphasize an explicit data base as their foundation. Substantive conclusions are restricted to particular settings, groups, times, populations, or problems (Yin, 2009; Merriam, 2002).

Conducting a Case Study

Given its value, then, a quick review of the process of developing case studies is useful. Case studies are by definition studies that are bounded to a specific location and topic (phenomenon). When researchers conduct case studies, they intensively examine and analyze specific units, individuals, or bounded systems in specific locations to gain information that identifies (exploratory) and explains (explanatory) specific issues and problems. A case in a case study does not have to be just a specific, bounded location, though. A case could also be a specific phenomenon (experience, event, or even time of year). For researchers, this can prove confusing during the design process, particularly as researchers may read accounts of nonlocation-related "cases" described instead as "phenomena." Regardless of the term used to describe the case, however, case studies themselves are limited to specific geographic locations with identifiable boundaries because they are peculiarity-seeking rather than generality-seeking (Stake, 2006).

Study Questions and Locations

When considering conducting a case study, researchers need to pay close attention to the questions their studies are designed to answer. Case study questions, even if the case studies use quantitative data, should not be designed to identify causality or correlations between two or more variables treated as variables. Instead, since they are designed to identify the nature of the factors involved in the phenomenon being

studied inside the bounded case, a narrow, two-factor examination should be replaced with an in-depth consideration of the factors that present themselves. So, as researchers develop their overall research questions, serious consideration about whether the research problem being examined yields questions appropriate for exploring or explaining the what, how, why, or when of a case study is necessary. Further, a clear examination of their questions will help researchers decide whether or not they should use a single, multiple, or comparative design for their case studies (Stake, 2006; Yin, 2009).

As mentioned previously, case studies can be used to examine either single or multiple locations. In basic exploratory studies, often one location is selected. Depending on the size of the instructional tool or method developed, an instructional design researcher might invoke a single case method (one location) to get a strong exploratory handle on the impact of that tool in one location before considering expanding its use to other locations. The *transferable* results, conclusions practitioners may draw when their own bounded locations are similar enough to the described bounded case (location and phenomenon) studied so that practitioners can reasonably expect similar research results were the study to be conducted in their location, as well (Merriam, 2002; Stake, 2006; Yin, 2009).

However, if an instructional tool or method researchers wish to study is already in use, researchers might choose to examine multiple locations (multiple case method) in order to get a more "instrumental" perspective (Stake, 2006). This type of study could examine one of two different types of scenarios. In the first type of study, the expectation is that all of the locations, for example, use an instructional design in the same manner—this is a simple multiple case study. In this type of study, if data bear out the commonality of outcomes, then the thick description of the specific locations and circumstances supplies information about the number of circumstances in which *x* result may be expected to occur if enough other factors are similar. In the second type of study, the expectation is that some locations are using the design in one manner, while others are using it differently. In this type of study, a comparative case method, the expectation is that the thick description provided in the report or article will help practitioners identify to which type of circumstances (case) their location is closer. As a result practitioners might better identify how to apply study results.

Case Study Options

Case studies normally incorporate face-to-face interaction so they can faithfully represent the often multiple, constructed, conflicting realities researchers may encounter due to the humanistic nature of qualitative inquiry. They also emphasize maintaining respondents' privacy and anonymity while utilizing extensive word-for-word, natural-language quotations (Guba & Lincoln, 1989; Merriam, 1988).

Case studies can focus on everything from individuals to institutions. For example, researchers use the "One-shot Case Study" design to observe a single group at a specific point in time for exploratory, or information-gathering, studies only. Normally, they observe their sample group following a specific event expected to elicit strong response. Researchers might use such studies following the evolution of an instructional program's use, the introduction of an radical design into a classroom, or when exposing a group of students to a potentially revolutionary collaborative process. Other researchers may focus on specific aspects of a case by looking at the culture's interaction with the phenomenon (ethnographic case study) by conducting a semiotic analysis (a unified approach that examines surface manifestations and their underlying meanings), a dramaturgical analysis (an analysis based on the content of drama), or a deconstruction (a search for multiple meanings implicit in such things as texts, conversations, or events). Historical case study researchers may focus on developing descriptions of institutions, designs, and practices as they have evolved over time (historical). Psychological case studies examine educational problems focused on the individual, which can prove particularly useful when examining aspects of human behavior, like individuals' learning or behavior related to the use of twitter in a classroom. Sociological case study researchers explore the constructs of society and socialization related to some phenomenon like social networking software, considering demographics, people's roles in that social life, and the community and other social institutions, and related social problems. Phenomenological case studies look for core meanings and understandings through those shared experiences, compare and analyze the experiences of different people to identify the essences of phenomena, and seek to gain some sense of defining characteristics of phenomena like collaborative instruction (Feldman, 1995; Merriam, 2002; Nachmias & Nachmias, 1966; Pedhazur & Schmelkin, 1991; Tashakkori & Teddlie, 2008; Yin, 2009).

Researchers collect different types of data based on the goal of their case study research. Typical data sources for each case study construction are discussed here. First, however, it is important to quickly consider the number of data sources required to conduct a strong case study. Based on the nature of the data sources used—normally qualitative or a combination of qualitative and quantitative sources—researchers using a case study design utilize source triangulation, which means collection and analysis of no less than three and, based on current case study trends, closer to six data sources (Yin, 2009). For example, researchers examining the use of twitter for students to share "aha" moments in a classroom might conduct interviews with teachers in different grades, if possible, considering each group of teachers a different data source. They might consider archival records for each of the grades; interview teachers as a data source; interview administrators as a data source; or review students' twitter records, journals they ask the students to keep, or extensive observations of each class as a data source. Each group of records for each class could serve as a data source.

Data sources useful for each type of case study need to be considered, as well. Ethnographic case study researchers most often use observations and groups of interviews or focus groups with relevant participant groups (teachers, administrators, students, or parents, for example). Historical case study researchers examine primary source materials (interviews, focus groups, journals, archival records about the period of time), often amassing hundreds of pages of data to analyze. Psychological case study researchers employ observations, interviews, archival records, and measurement techniques utilized by psychologists. Phenomenological study researchers use data sources that provide the participants' own words—journals answering specific questions asked by the researchers, interviews, focus groups, essays—all of these sources answering specific questions being asked. Sometimes archival records, like photographs, drawings, or other materials are used to stimulate discussion (Merriam, 1988; Yin, 1994). (Feldman, 1995; Merriam, 1988; Merriam, 2002; Yin, 2009)

Study data collection can occur sequentially or concurrently (Stake, 2006; Yin, 2009). For example, if researchers determine there is a gap in knowledge surrounding whether the use of cell phones in the classroom could facilitate students conducting instant internet research and networking to facilitate enhanced learning, they consider what methodology would work best for them. They determine they need to conduct an exploratory study to see whether cell phone use is actually a viable alternative. Since they discover they cannot conduct the study in local public school systems, they decide they will examine cell phone usage in a Montessori high school in their area using a case study. They train classroom facilitators (Montessori classroom teacher equivalents) on potential uses of cell phones, and brief students on how they can use the cell phones after they have participating students complete surveys about how they believe they might use cell phones in their classrooms. Following that, for one month they conduct two-hour long classroom observations twice a week at random times. Concurrently, they have students keep a journal about their use of cell phones and the types of activities for which they used them. After collecting all these data, the researchers analyze the information, identify which questions they would like to ask the students and facilitators based on the analysis, and conduct an interview with each student and facilitator to answer those questions. They conduct one more analysis and, if they still need more information, they conduct final focus groups where researchers share with students and facilitators a number of their conclusions and the patterns they identified, getting feedback on their conclusions. Having collected this extensive data, they draw final conclusions about students' use of cell phones to expand learning in Montessori high schools and write the report.

In another example, researchers plan to consider the use of blogs and Skype to create collaboration between schools in different parts of the country or in other countries. They identify four schools—two in the Northeastern United States and two in the Southwestern United States. The four schools are sister schools, networking sixth grade social studies classes with each other through the use of individual student-created blogs and classes' weekly small group activities. Two schools, one in the Northeast and one in the Southwest, are Montessori schools, while the other two use a traditional classroom structure. This could pose particular problems for researchers, but it does not need to. Researchers in this case begin by conducting interviews by Skype (with a phone back up) with teachers and administrators in each of the four classrooms in each location. After that, they conduct reviews of student blogs for a one-month period and of their Skype record interviews, each serving as a differ-

ent data source, categorizing and analyzing them by type of classroom structure and, also, by part of the country. They follow that with a set of questionnaires students in all locations complete that ask relevant questions about the blogging and interaction experience. After one more analysis, they present their findings via videoconference to students in class-sized focus groups and get one last round of data as they receive feedback on the conclusions they have drawn. Finally, they write a report on their study and its results.

One last important consideration when conducting qualitative research is the assurance of study integrity and trustworthiness, just as validity and reliability are essential in quantitative research. However, the methods for ensuring research integrity and trustworthiness are different for qualitative research. Feedback from study participants in focus groups, for example, provides peer reviews for study conclusions and increases study accuracy. Intersubjectivity (input from numerous individuals/subjects) proves important to allow greater representation of multiple perspectives, which increases study trustworthiness (representation of a number of different inputs) and, as a result, study validity. Finally, focusing specifically on answering the research questions, ensuring that all data sources are the best choices to answer those questions, researchers ensure research reliability (Golafshani, 2003; Howard, Lothen-Kline, & Boekeloo, 2004).

Conclusion

Researcher practitioners, particularly instructional design researcher practitioners, straddle both the worlds of the theoretical and the practical. Examining learning needs and testing the impact of designs, such practitioners need a clear understanding of what is occurring with the design or instructional methods they are examining. As such, they often need research designs that allow them to gain in depth understanding of not just the what, but also the how, when, why, or who of a phenomenon. Although a number of study designs could be tailored to serve that purpose, case studies often provide the best source. This article has provided insights into how to use a case study design, the key factors to consider when developing one, and examples of the use of a case study. Finally, it provided factors to consider in order to ensure the design's integrity. Case studies can be useful tools in the researcher practitioner arsenal.

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Instructional Design and the Training of Chaplains for Combat Medical Ministry

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Abstract: In an organization as vast as the United States Army, there are many different instructional design applications that can provide different kinds of insight into the field. This article presents how instructional design practice and principles have been applied in the Combat and Emergency Medical Ministry Course presented by the Department of Pastoral Ministry Training (DPMT) at the Army Medical Department (AMEDD) Center & School. Lessons learned include reminders as to the powerful impact training can have on the target audience (and its audience, too) and of some of the basic principles of instructional design that sometimes are forgotten amidst the many activities instructional designers perform.

Keywords: instructional design, design practice, basic principles

Army Chaplains have been at the frontline of combat, supporting troops in their most difficult moments, since 1775. What many people don't know, however, is that Chaplains serve in the forward medical facilities, combat support hospitals (CSHs), and regional hospitals where the wounded come to begin healing or to die. To be prepared, some Chaplains participate in hospital clinical pastoral education (CPE), a year-long training program (ACPE, 2008). CPE is the model program for medical ministry training, both in and out of the military (Snorton, 2006). However, due to the time and resource commitments necessary to train Chaplains in this manner (thus limiting enrollments), CPE is currently not an option for all Chaplains needing medical ministry training. Also, National Guard and Army Reserve personnel do not have access to the year-long program. Since current combat operations have required more personnel than have been trained through CPE, an alternative was put in place. Combat Medical Ministry/Emergency Medical Ministry (CMM/EMM), a two-week course presented by the DPMT, provides the training for Chaplains and Chaplain Assistants to prepare them for the rigors of one of the most difficult ministerial tasks in the world: emergency and combat medical ministry. Instructional design in the CMM/EMM course is the topic of this article.

The genesis of the instructional design work undergirding this article is found in the DPMT staff's desire for continual improvement. Because internal staff time was limited, the DPMT created space for and obtained funding to bring in a pair of contract instructional designers. The focus of these designers' contract was to develop new courses, but also to collaborate with staff on the improvement of the CMM/EMM course. Significant experiences of these instructional designers and the training team Chaplains over the course of the past year are chronicled below. Hopefully, new and experienced instructional designers can find additional insight into the field through these experiences.

Information about Casualties

Since the beginning of Operation Iraqi Freedom in 2002, more than 6,600 Soldiers have been killed in action and more than 62,000 have been wounded in a way requiring medical evacuation from combat zones (Congressional Research Service, 2010). Injuries can be significant physically, mentally, and spiritually. A Soldier who has lost a limb to an improvised explosive device (IED) or one who has been shot, injured in a vehicle accident, or harmed in any other way goes through emotional and physical crisis. Helping those Soldiers that survive wounding or who grieve over the loss or injury of their fellow Soldiers is one of the primary roles of Chaplains. Like other medical care providers, Chaplains spend much of their time helping people whose lives have been shattered. Coping with the waves of trauma that are inherent in war is a difficult task, but, as with any task, preparation can make a difference in the success of the intervention.

There are over 1,500 active duty Chaplains in the Army with hundreds more Chaplains in the Guard and Reserves. For every Chaplain or Chaplain Assistant there is a first time to be deployed to a combat environment. Since very few people have experienced anything compared to combat, UMT members who have not deployed have no conceptualization of what they will soon encounter and the toll it will exact from them. For those assigned to a combat support hospital (CSH), the magnitude of their experience increases many times over. One of the instructors in the DPMT was deployed with a brigade that experienced more than 25 deaths in a year-long deployment. UMTs serving in a CSH see that many individuals in a week, all in crisis.

The CMM/EMM course was specifically designed to reinforce the Chaplain's mental and spiritual strength by putting him or her in a position to taste what the combat medical experience is like. In the course as it was put together at the beginning of this project, Chaplains and Chaplain Assistants were exposed to the rigors of trauma while serving as duty Chaplains/Chaplain Assistants at Brooke Army Medical Center, participating as the Chaplain on the trauma team, and receiving another 60 hours of training on topics ranging from Grief and Loss to Traumatic Event Management and Ethics. The resulting changes to the course have not been radical, but they represent an important shift in how such courses are viewed and how improvements can be made. The instructional systems design (ISD) steps known as ADDIE (Molenda, 2003) serve as the framework for this discussion, since ADDIE served as the framework for the changes made to the course. ADDIE is the instructional design process used to guide all formal instructional development throughout the U.S. military.

Information about Analysis

The first task given to the instructional designers was to analyze the current course. Since the task analysis had been completed earlier, the initial "analysis, for this revision of the course, consisted of formative evaluation--that part of ADDIE that would again propel us through design, development, and implementation. As has been mentioned, "(t)he purpose of formative evaluation is to revise the instruction so as to make it as effective as possible for the largest number of students." (Gagne, Briggs, & Wager, 1992)

Evaluation/analysis provided a great opportunity to sit in the classroom and watch instructors teach with a focus on identifying what works with the audience and what doesn't. In combination with observation, additional evaluation instruments were added to the course to supplement our analysis. Students took a Spiritual Attitude Inventory (USACHPPM, 2009), completed section and course evaluations (representing response, Kirkpatrick level 1) and received pre and post tests representing learning (Kirkpatrick level 2) (Kirkpatrick & Kirkpatrick, 2006). The course-response data were analyzed by aggregating the means, examining trends over time, and performing qualitative analysis of the student comments by looking for trends. The student pre- and post-test scores were examined to see in which content areas the instruction was not meeting the needs of the students. While the tests themselves are still in the process of being validated, preliminary information has already given the instructional designers insight into the effectiveness of the content and helped them identify changes that could be implemented in the course. The analysis provided three significant lessons.

First, learner characteristics were better defined, which helped narrow the focus of the instruction. As noted by Bednar, Cunningham, Duffy and Perry (1995), what is meant by a learner, is most frequently a larger population of learners, and includes the general conditions and range of how the system needs to function. From the data and observations, it became apparent that the audience was not homogeneous. The Unit Ministry Team (UMT) consists of a Chaplain and a Chaplain Assistant. In most cases there

are several differences between the two members of the team. Typically, the Chaplain is older and the assistant younger; the Chaplain is an officer and the assistant is enlisted; the Chaplain has a religious affiliation and the Chaplain Assistant may not; the Chaplain has a master's degree or doctorate and the assistant's education begins with a high school diploma and may go to a bachelor's degree. While some assistants have more education than that, the proportions are very small. Understanding the audience is key for adapting training.

Second, breaking up long stretches of PowerPoint slides was important. Death by PowerPoint is almost a cliché. However, anyone who has sat through four-hour blocks of PowerPoint instruction without a change in instructional method understands the possible mind-numbing effects. Also, by repeating content presentation through role-plays, the learner has a chance to deepen his or her understanding of the content. Although the tight scope of the course prevents significant spacing effects from occurring (Thalheimer, 2006), it doesn't decrease the power of modeling and repetition (Taylor, Russ-Eft, & Chan, 2005).

Third, the complicated skills of dealing with grief, performing a crisis intervention, or responding to trauma, cannot simply be described to be learned. One of the strengths of the course before our arrival was the time spent actually working in the trauma room providing pastoral support while working under the supervision of an experienced trauma Chaplain. Our goal, where possible, was to replicate that kind of learning in the other areas of the course. This meant increasing role plays and practice sessions where the students assume the roles of the injured or grieving party and the Chaplain or Chaplain Assistant who provides the help.

After examining these three areas, it became clear that more activities and role plays were needed to address our three concerns. First, activities would help address the differences between the Chaplains and the Chaplain Assistants. By doing role-plays, each would get to experience the topic in his or her own role and sometimes in the role of the other. Second, interactive activities would help break up the PowerPoint presentations and allow the learners time to digest and implement their instruction. Third, activities and role plays would give the students an opportunity to practice the skills they were learning. To prepare for such activities and role plays, the instructional designers identified media tools to provide intermediate knowledge between the theory and practice. These tools help place the learning in context. Thus, based on a careful analysis, creating active learning activities and adding appropriate supportive media became the goals for the course improvement.

Information about Design, Development, and Implementation

Based on these goals, the first changes to the course had to do with increasing the fidelity of the course in terms of representation and practice. For example, video was added that showed what the UMTs would be dealing with in the field. Luckily, there was an HBO film produced in 2003, *Baghdad ER*, that showed trauma and also showed the Chaplain's role in the trauma room. Using copyrighted media, like Baghdad ER, adds its own strictures to development (allowing for time to obtain permission to use the content in training, for example), but has the benefit of a typically higher aesthetic as well as access to content and situations not normally available to instructional designers. Using the video allowed Chaplains without experience in a deployed environment to see actual events, thus helping them to foresee what their experience ministering to a person whose leg has just been blown off might be like. Next, role plays and group activities were added. What do you say, for example, to a Soldier who's just lost his battle buddy to a sniper attack? Also, the team developed an Oregon-Trail-type game (Sugar & Brown, 2008) with the goal of placing the various learning topics into their practical context. In the game, students manage their time through the use of tokens, allotting hours to sleep, physical training, spiritual development (for Chaplains), rapport with fellow Soldiers (for Chaplain Assistants), personal time, and coordination. Based on the student's choices on how to distribute his or her time, the day plays out differently. The game has been a great teaching tool for those who haven't deployed. As noted by Klopfer, Osterweil, and Salen, "The productivity of gaming environments lies in the fact that [students] among themselves are free to discover and create learning and teaching arrangements that work for them." (2009)

To change the pacing of the instruction, good ideas from instructors teaching the course for limited sections (and who used a more diverse approach than simply PowerPoint) were implemented in order to spread those ideas into other areas. This meant developing a combination of PowerPoint, role-playing activ-

ities, group work, games, video, and journaling. The instructional designers made sure that the materials necessary for group work were provided so that it wasn't difficult to set up and lead brainstorming and other collaborative activities.

Also, an audience response system (ARS) was introduced into the course. Audience response systems allow learners to use remote controls to participate in polling, group questions, or activities. Software tied to the remotes aggregates the data from all the students and allows for immediate display of a snapshot of answers. Unfortunately, due to technical problems with the Qwizdom ARS tool utilized in the course (it slows down the longer the system is used; sometimes taking two-to-four minutes to move from one question to another) it isn't as useful as it could be. However, the activities using the ARS are always welcomed by the students and serve to increase student enthusiasm.

Finally, the issue of audience disparity was addressed. This proved to be the one item for which there was no "best single answer." To increase the educational level of the course to meet the Chaplains' needs would most likely move the course content outside the zone of proximal development (Vygotsky, 1978) for the Chaplain Assistants. Likewise, role plays that are good for the Chaplain Assistant are oftentimes seen as too basic for Chaplains who have more counseling experience. This conundrum applied across the board. So, the approach taken to deal with this difficulty was variety. Sometimes higher-level content is taught and the Chaplain Assistants struggle. Sometimes the content is more basic to meet the needs of the Chaplain Assistant. Variety provides the opportunity to balance the instruction so all learners benefit.

Evaluation

After addressing the concerns and implementing changes, evaluating these changes was the next step. The same processes used in analysis provided information about the changes made. Tracking student evaluations, monitoring, especially, their comments about each section of instruction, proved fruitful. Also, continued observation of the course and watching the implementation of the various new approaches helped the instructional designers refine the processes. In most cases students were appreciative of the changes implemented. However, not all students appreciated all changes (a byproduct of the audience issues noted above). In fact, sometimes meeting the needs of certain students means decreasing the satisfaction (if not the learning) of other students. For example, where more interaction was instituted, some students pointed out how much they enjoyed PowerPoint. Continual monitoring of student data (checking for age of the student population or the numbers of previously deployed Chaplains and Chaplain Assistants) has been useful for tracking trends and for testing and improving activities. Demographic data were gathered for each course and compared to the evaluations and overall response to the course. Continued observation of sections of the course allows the designers to make recommendations for improvement. Monitoring the course and making changes requires a time commitment that can be significant, but it is very useful for incremental change.

Speaking of incremental changes, one example demonstrates the benefits of trying out different methods of instruction to find the most effective instructional practice. In the course, a review activity was conducted using a learning game that utilized the ARS. The game had two scoring options: one in which the first correct answer from a team of students won all the points and another in which team scores were aggregated. Students quickly figured out option one and teams would simultaneously submit each possible answer so as to be the first to answer correctly in order to win the point. This was not helpful for learning. The designers switched to the other (aggregate) option. Such wrinkles to the process were ironed out based on continuing evaluation and improvement.

As updates to the course were made, it became clear that improvement is an ongoing process that is often limited by resources. The changes that were made were based on resource availability. At the point at which more resources might become available, more improvements could be made. For example, crisis intervention is difficult to practice without a role model to emulate. While videotaping students performing role-plays was implemented to provide a talking point for practice, a better approach would be to increase the fidelity of the demonstration intervention video. A more realistic setting, better acting, and the demonstration of intervention skills would help students visualize actual interventions. Another useful instructional tool for interventions would be a simulation in which students could try many of the common intervention techniques (both correct and incorrect). The immediate presentation of consequences demonstrated by such a tool would help students avoid some of the negative effects of poor interventions. While

resources aren't available currently for these types of tools, the results of our evaluation indicate that the tools would be beneficial.

Last of all, Kirkpatrick level 3 evaluations (Kirkpatrick & Kirkpatrick, 2006) have been sent out one year after each course section to determine if the instruction was helpful, what information may have been lacking when compared to the operational environment, and what recommended changes could be made to the course. So far, the comments received back have been positive about the effect of the course on the Chaplains and Chaplain Assistants who have responded to the survey.

Discussion and Recommendations

As instructional designers approach working with clients from the complete spectrum of learning needs, some enduring factors must be taken into account (and these are some of the lessons learned from working on this course). First, instructional designers are really in the people business, meaning they work through, with, and for people. Respect is a key component. The adage, "I don't care how much you know until I know how much you care" implies caring, understanding, and acknowledging where each individual is in his or her life. This includes recognizing the constraints that currently limit performance and respecting the knowledge and experience each participant brings to the desired educational goals. The significance of relationships is important for the instructors, the technology or support staff who help with the achievement of the learning outcomes, and the students who will apply the content provided and use it to protect, defend, and serve others. Instructional designers who cannot contribute to these kinds of connections will find they can make little headway in fomenting instructional change.

Second, instructional design is typically an ongoing process based on experience and iterative change. Each instructional design solution carries with it a package of constraints, or "layers," (Gibbons, 2003), that, had they been different, may have resulted in a different instructional solution. Instructional design products are also a result of the experience and knowledge of the instructional designers working on the project. As the constraints change with time and as instructional designers know more (through experience or evaluation), instructional products should be tested so they may, if necessary, be transformed. They should be tested to verify that they are still adequate and, hopefully, optimal. If the products are found wanting, then they should be changed.

Also, the initial ideas designed to meet student needs will have to be tried, revised, and tried again. This is not a flaw in the system. Instructional designs live in the same way that databases, daily news, and other information processes based on learning, growing people live. Because changes are wrought simply by students and context existing from day to day, the instruction must adapt, too.

Third, instructional design processes are driven as much by available resources as they are by desired instructional outcomes. The available amount of subject matter expert (SME) or faculty time determines the amount of change that can be implemented at any time. As workload increases in the office so that the trainers' duties increase, the amount of time for instructional modification and change decreases. The same basic principles apply to technology, software, and other resources that can improve final instructional product.

Fourth, ongoing evaluation will provide the best measuring stick for how well instructional goals are being met. There are differing metrics for course effectiveness. Student evaluations (e.g., Likert scales) give one perspective. Testing provides another. Practice portrays even another. In the best situations, long-term performance gives the best picture of the impact of instruction. Constant evaluation helps to discover trends in students and trends in instructional practice. Ongoing evaluation can track content creep (where content and presentation change incrementally based on student interaction), but documentation lags since no "major changes" have occurred.

Conclusions

While working on this fairly traditional course (although there are online components in addition to the instructor-led components), the instructional designers learned a variety of lessons. It has been encouraging to note that the methods used to create good instruction have power across modalities. It has been insightful to recognize that all instruction is bound by constraints (time, money, and skill) and that people do the best they can with the resources available to them. Most of all, this course has been a reminder that training is used to improve lives. Working with the DPMT faculty has been eye-opening to the work entailed in meeting the needs of Soldiers throughout various combat environments. It has allowed us to use our skills to

improve the training Chaplains and Chaplain Assistants receive as they embark on a very difficult task—meeting the spiritual needs of our Army Soldiers in the dehumanizing battlefields of war.

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Essay:
Educating for an Instructional Design and Technology Future

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In the first issue of The Journal for Applied Instructional Design (April 2011), Wagner challenged the instructional design and technology profession to consider what it is we do as a profession. Wagner asked, "what do YOU think an ID should be able to do? Are we technologists? Psychologists? Evaluators? Programmers? DO we need business skills? Theoretical cognitive skills? IT skills? Are we artists or engineers or a little of everything in-between?" (p. 37). Educators and professionals in instructional design and technology (IDT) are becoming aware of an emerging message that IDT is changing as a profession – in Wagner's words, one that is embracing a level of technology proficiency, an awareness of design, and an ability to communicate (p. 37) along with traditional skills about knowledge of theory, models, and processes. If the tasks being embraced are evolving, how are these changes being conveyed to new instructional designers wishing to enter or move further in the profession? The goal of this essay is to launch a conversation about changes in the ways IDT concepts are taught and a possible career path for those entering the instructional design profession.

The Past informs the Future

Professionals who have contributed much to the idea of the changing profession (Dijkstra, 2000; Jonassen, 1997; Reigeluth, 1999, 2009; Silber, 2007) echo the message that IDT is a form of problem solving. Christensen and Osguthorpe (2004) expressed the concern that it is not known how instructional designers actually make instructional design decisions, raising doubts about whether ID processes are as procedural or prescriptive as once thought. Ertmer and Stepich (2005) referenced a key point by Jonassen that "ID is a complex, ill-defined skill that is largely (perhaps entirely) dependent on the context in which it is done" (p. 38). Christensen and Osguthorpe acknowledged Reigeluth, in that he "emphasized that prescriptive theory concerns what the instruction should be like, while the ID process outlines how to plan and prepare the instruction" (p. 46). Silber (2007) reinforced these changing ideas when stating that "ID should be taught as ill-structured problem solving rather than as a procedure, using appropriate methods" (p. 13). Kim, Lee, Merrill, Spector, & van Merriënboer (2008) indicated that teaching and learning are moving "from a content-centric perspective to a user-centric perspective" (p. 808), resulting in a shift from what is done with the content toward greater awareness of context and processes of learning.

The shift away from having content presented is true for how IDTers work as well, in that interventions are designed and created rather than content being presented. If teaching and learning paradigms are changing, instructional design approaches need to change, and this implies a need for a change in the way instructional designers are taught. If the learning paradigm is changing, then logically it is time for teaching about instructional design and technology to change as well.

Framework to Guide Reflection

Understanding ideas related to instructional design technology, principles, learning, problems, and problem solving set the stage for thoughts presented in this essay. What it means to be an instructional designer and technologist has changed from earlier 1950s definitions to more current understandings of the role. An instructional designer:

> "invents, conceptualizes or creates concrete products or materials for instructional or educational purposes … is responsible for the educational, instructional, or pedagogical aspects of the product… is able to reflect on his or her work" (Visscher-Voerman & Gustafson, 2004, p. 70).

The Association of Educational Communications and Technology (AECT) defines instructional technology as "the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning … a discipline devoted to techniques or ways to make learning more efficient based on theory but theory in its broadest sense, not just scientific theory" (AECT: 2.What is the Knowledge Base?, para. 4). These concepts – design, development, evaluation, processes, learning – are akin to those used by Visscher-Voerman & Gustafson (2004) to describe the role of an instructional designer. These roles seem to be merging.

Jonassen (2002) explored complexity as it relates to instructional design and determined that "Problem solving is not … a uniform activity" (p. 110), hinting that prescribed procedures no longer fit the needs for IDT. Absent the premise of uniformity in instructional design processes, how can one determine skills and principles that instructional designers and technologists need to know in order to practice their profession? How does a principle-based approach help solve instructional design related problems? The challenge for the instructional design profession is to find ways to help instructional designers and technologists learn how to perform in the profession – that is to rely on early experience, demonstrate skills, apply and integrate – to integrate stable principles and problem solving to reach an instructional design solution.

The positioning of concepts related to problem solving compared to following procedures for instructional solutions creates opportunities to explore learning and teaching in new ways. These opportunities help advanced instructional designers focus on a variety of solutions and approaches to enhance learning (divergence) rather than strive to have the learner achieve a predefined goal (convergence). Generic steps for problem solving strategies are skills that enable advanced instructional designers to understand and implement complex learning interventions. Problem solving skills should become a part of the advanced instructional designer's toolkit, and these problem solving and design skills need to find a systematic way to be conveyed to novice IDTs.

Experience Guides the Discussion

Sims & Koszalka (2008) began to address advanced roles and skills instructional designers may need with the point that it "may no longer be the instructional designer's role to define, but rather … to enable [emphasis added] the individual participants to adapt the learning environment to their individual and contextual needs" (p. 573). Current thinking embraces the idea that IDT is a field of learning sciences as suggested by Jonassen, Cernusca, & Ionas, (2007). More than a decade earlier, Jonassen (1997) made the point that instructional design is a problem solving process, and ill-structured problem solving can be thought of as a design process, rather than a systematic procedure for problem solutions (p. 79), ala the instructional design systems approach of the past; and Dijkstra (2000) made the point that design problems are "more challenging than more directive and confined learning tasks and goals" (p. 218). The IDT experts in the profession are beginning to voice the similar refrain that IDT is not about process and procedures but about creatively solving learning challenges.

A strong theoretical foundation is needed to support this potential transition and promote further discussion by the IDT profession. IDT was and is informed by cognitive psychology literature where the premise is that teaching involves well-structured procedures (Silber, 2007, p. 11)… but a significant development in the past five years has resulted in a move away from cognitive psychology literature and/or information processing theories as evidenced by ideas that "Content has become readily available and rich in representational formats" (Kim, et al., 2008, p. 808), which is creating a shift "from a content-centric perspective to a user-centric perspective" (p. 808). This shift calls for changes for considering what is done with the content, not the content itself, and this shift begins to change theories and foundations of IDT prac-

tices. As Kim et al. (2008) emphasized, "...learning tools are changing. Learning tasks are changing. Learning perspectives are changing" (p. 811). Changes regarding learning from an acquisition of artifacts and the ways in which learning is beginning to occur need to inform ways in which IDTers begin the transition from historical process stages to more advanced stages of divergent thinking about learning interventions.

Embracing these ideas moves thinking about instructional design solutions away from communicating with learners and toward engaging learners in learning processes. Sims and Stork (2009) reinforce this concept when they emphasize that "the role of instructional design needs to be repurposed so that predefined assumptions about the learner are struck from the design process and replaced with an emphasis on what a learner might or could do with the content and activities to achieve course objectives as well as their own educational goals. … instructional designers must create plans that allow learners to impose their own socio-cultural contexts to the course strategies and content" (p. 1). This is indeed a paradigm shift from the traditional approach to IDT.

Emerging Career Ladder for the IDT Profession?

Based on the previous points, the time has come for considering a continuum of instructional design roles, skills, and areas of influence. Regarding instructional design, Kim, et al. (2008) made the point that "At the master's level, the emphasis should shift from training students to be users of instructional technology to preparing them to manage, supervise, and inspire those who use instructional technology…" (p. 814). Consider the medical field that also extensively uses problem solving skills. In the medical profession, one finds general practitioners, physicians' assistants, and specialists, nursing assistants, nurses, nurse practitioners and other medical personnel. Using this analogy is the master's level instructional design student the physicians' assistant and/or the nurse practitioner of the instructional design field and those who use instructional technology the nursing assistants, lab techs and other medical personnel? Kim, et al. expand on these thoughts when they make the point that

A doctoral student in instructional design should be able to identify, modify, and develop an instructional design theory (this corresponds to an advanced instructional design competency….). … should conduct extensive product and research literature reviews related to the theory of interest…. Conduct additional original empirical research related to the theory development…. Also develop tools that implement the theory in an appropriate context or setting…. Demonstrate use of … tools for the design of instruction and evaluate or supervise the evaluation of instructional products developed by the use of these tools in a field setting (p. 814).

Given the analogy of the medical profession and recent expectations related to highly trained instructional designers, an IDT professional with an advanced degree may be considered equivalent to a general practitioner or medical specialist with additional training and experience required to participate in higher level problem solving activities espoused by experts in the field. A continuum of education and experience in instructional design and technology needs to be explored that helps move an IDT professional from early practitioner stages to later scholarly, visionary and complex problem setting and solving stages.

Ertmer, Stepich, York, Stockman, Wu, Zurek and Goktas (2008) conducted a study that "examined how instructional design (ID) experts used their prior knowledge and previous experiences to solve an ill structured instructional design problem" (p. 17). Based on results of their study, three specific strategies were suggested for educating designers:

(1) helping students conceptualize the key issues in an ill-structured problem by scaffolding their analysis efforts to be more expertlike; (2) helping students accumulate a variety of ID experiences, directly or vicariously, that they can draw on when faced with an unfamiliar design situation; and (3) enabling students to index these experiences in a way that facilitates efficient recall of relevant cases and principles when solving future ID problems (p. 38).

Conversations about career ladders and changes in the way IDT is taught are beginning to occur. Hokansen (2012, in press) suggests a teaching and learning approach that has been in practice for some time, that of the design studio. "The studio/critique system can be mapped to various mainstream educational concepts. The design studio itself is comparable to problem-based learning, where complex challenges are posed to learners in various domains. Learning through solving authentic problems is valuable, both in terms of content and in the development of higher order thinking." (p. x). The implication is that education and professional development of IDTers moves from a focus on technology and process to ideas related to principles and learning sciences, strategizing and com-

plex problem solving. The challenge for the profession is to consider the continuum of knowledge and practices that depict the journey from novice to advanced instructional designer. This continuum is beginning to evolve as denoted by recent terms and descriptions such as designer by assignment, faculty designer, web designer, media technologist and others.

Merrill (2002) coined the term "designer by assignment" to denote someone with content expertise whom is given the role of designing and developing a learning intervention for a specific situation, content area, and/or industry. This designer by assignment may align with earlier described practitioner roles of instructional design, similar to the earlier medical analogy of the intern, nursing assistant or lab technician in relation to the general practitioner. Designers by assignment have knowledge of their fields and some specific skills to help them accomplish limited design and development. What are the educational and experiential requirements to move beyond this level? There is both room for and a need for various levels of instructional design expertise and practice within the profession of instructional design and technology.

Smith (2008) and Rowley (n.d.) point out a gap in professional preparation of IDT professionals. Rowley emphasized "there are large numbers of jobs for instructional designers with a bachelor's degree in instructional design. Additionally, many instructional design positions are held by SMEs, writers, software engineers, and others who are capable but uncredentialed in instructional design" (p. 1). The rungs of this potential career ladder are reflected in numerous paradigms in which IDTers find their work. How does the instructional design profession relate to career ladders in other problem solving professions? Vischer-Voerman and Gustafson (2004) described four paradigms about "different design approaches to different basic types of design paradigms, each reflecting different stances toward the world in general, and toward design in particular" (p. 76). The four paradigms are

Instrumental paradigm: planning-by-objectives.

Communicative paradigm: communication to reach consensus.

Pragmatic paradigm: interactive and repeated tryout and revision.

Artistic paradigm: creation of products based on connoisseurship. (p. 76).

These paradigms are reminiscent of various work-related environments and build one upon another from the designer by assignment to the high level IDT problem solver. Table 1 provides a point of reference to begin exploring ideas about how the paradigms fit into levels of specialities or roles related to instructional design.

The role descriptions in the previous table could be presented as continuing rather than discrete contexts, giving credence to the idea of a continuum or career ladder, indicating novice to expert and laying the foundation for the notion of beginning to more advanced skill requirements and theoretical foundations. Each level, setting and outcome calls for a different set of competencies. Each rung of the career ladder implies that earlier skills inform skills needed on the higher/more advanced rungs. It may be time to focus attention on both the lower rungs and upper rungs of the career ladder as certain skills benefit various levels of specialization. Now may be the time for the IDT profession to consider a system where early competencies are shown to be mastered as one moves on to more advanced levels of instructional design expertise.

A Call for Further Discussion

Sims and Koszalka (2008) emphasize that

> … when considering existing sets of competencies for the instructional designer, we also must be very aware that significant social and technological changes are impacting the way we teach and the way we learn. As a consequence, it is essential that those who practice instructional design build new understandings of emergent learning environments to ensure that their practice is current and relevant. (p. 574)

If you concur with the previous quote, carry it forward by exploring how future IDT professionals are being taught in order to ensure their practice is current and relevant. Sims' and Koszalka's perspectives lend credence to the idea of higher level scholarly and strategic thinking by advanced instructional designers which implies skills to be gained through experience and higher education. The concept also brings us full circle to skills and competencies needed by both beginning and more experienced and highly educated IDTers. Is it time to move away from emphasizing the time-worn ADDIE framework and various procedural approaches for instructional design toward an instructional design world that emphasizes an epistemological approach of constructivism and focus on problem solving skills and principles, thereby helping ensure more effective learning and performance outcomes? The time has come for the instructional design and technol-

TABLE 1	POTENTIAL INSTRUCTIONAL DESIGN PROFESSIONAL LEVELS AND PARADIGMS		
ID PARADIGMS ALA VISCHER-VOERMAN & GUSTAFSON (2004)	POSSIBLE LEVEL OF IDT SPECIALIZATION	PROFESSIONAL CONTEXTS	EDUCATION LEVELS
Instrumental paradigm	Designer by assignment	Public school teachers; Curriculum and development leaders; Manufacturing/task oriented businesses; College faculty	Bachelors Content expertise in a field (experience or master's degree)
Communicative paradigm	Human performance improvement professionals; Technology specialists	Human performance technologists; Business analysts; Curriculum specialists; Instructional designers; Project managers; Process improvement specialists	Masters
Pragmatic paradigm	Efficiency consultants; process improvement specialists; Training directors	Human performance technologists; Course development leaders; Managers of online course development	Masters and Doctorate
Artistic paradigm	Cutting edge of thinking about web-based learning; new technologies; new paradigms about learning	Higher education; Education entrepreneurs; Visionary education leaders; Advanced instructional designers	Doctorate

ogy professions to determine how to achieve what Kim, et al. (2008) described as performance and "instructional models [that] will become more flexible with regard to time, place, and content and will also allow for richer varieties and mixes of learning support, including more support for guided and self-directed learning" (p. 810).

The instructional design profession has the expertise to devise ways to begin to migrate procedure-based approaches to the foundational archives and historical roots of IDT and begin to help emerging instructional design professionals focus on complex problem-solving approaches, consider learning sciences, re-focus on learning (rather than teaching), and promote a paradigm shift for the instructional design profession. Reflecting on visions articulated by professionals who have "lived" the early years of instructional design (Jonassen, Merrill, Moller, Moore, Reigeluth, Silber and others) will help create a path toward principle-based instructional design and high level performance-based problem solving, integrating the use of technology to further impact performance and learning.

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Book Review:
The Next Generation of Distance Education: Unconstrained Learning

Moller, L., & Huett, J., (eds.) (In-Press), Springer Publications.

Reviewer: Sonja A. Irlbeck, Capella University

The timing of this book is both propitious and precipitous – Propitious because experts came together in summer 2010 and committed to publishing timely ideas to share. Precipitous in that the ideas are momentous – or as Huett describes in the preface, dikes are straining and about to burst with ideas related to how web-based technologies are revolutionizing learning and reshaping educational processes.

In graduate school, one engages in conversations (virtual and real) about disconnects between what is needed in the real world and what is being taught in learning venues. Disconnects in learning are happening at all levels – business, higher education, distance education, and entrenched local levels. At the same time, elements that inform our instructional design profession are maturing and are available for application and implementation at all levels to help bring *how* people *learn* in line with *how* people are *taught*. Concepts about these next generations of learning and teaching are the focus of this book.

As greater understanding in neuroscience, coupled with technology enabled teaching and learning and the inspiration of the internet become more attainable, the nature of education and training has changed. How do we design effective instruction and harness ideas that begin to foster change and greater learning? This books presents several ideas, such as Hokanson's thoughts related to design review as an important aspect, or ideas from Spector that distance education is becoming commonplace throughout all educational venues and is an experience occurring in a *technology-enabled learning environment* that is no longer two dimensional but multi-dimensional. Technology-enabled learning is at the doorstep of sweeping changes, formats and environments for learning in today's society.

Cleveland-Innes and Garrison's chapter describes how the teaching and learning emphasis has shifted – from *what* to learn to *how* to learn. Impending and current changes in technology, financial realities, ever more information to be learned and applied, the culture, and the world are examples of factors impacting how education will be 'done' in the future. As one thinks about the *how* of learning, the first chapter (Moller, Robison & Huett) frames the discussion by proposing principles to guide the next generation of learning including "learning experience design" and encouraging us to harness strengths of technology. This book formalizes some of the ideas about how technology helps everyone learn in new ways. Consider a recent study (Landeros, 2011) about creating 'travel apps' for disabled learners when traveling by bus in their communities, enabling greater independence, access to resources, school and jobs.

Chapters in this book provide insight into the future of instructional design, teaching and learning, concluding with a compilation of classic articles about instructional design prior to 1990. While an important foundation for today's thinking, I found myself also wanting recommendations for recent writings (within the last ten years) that help inform ideas shared in the book.

I for one am ready for the renaissance that Huett claims is about to happen. The challenge may be in finding leaders brave enough to allow the dam to flow with inspired thinking to begin shaping education for the future that is here today. This book can help shape thinking and prepare for changes that are knocking at our professional doorsteps.

Review of Instructional Materials:
Identities: English is Part of Who I am.
4-Semester English Series for Mexican High Schools

Douglas Tedford (2011), Cengage Learning, Mexico.

Barbara S. S. Hong, Penn State University

Identities, by Dr. Douglas Tedford (Cengage Learning - Mexico) is a multilevel, constructivist, competency-based, and communicative American English course designed for high school students in Mexican public high schools. *Identities* aims to foster a positive attitude towards language learning, encouraging students to make English part of their own individual identity and a key part of their personal, academic, professional and vocational development.

Thematic teaching strategies guide students through carefully developed grammar and vocabulary activities leading to the creation of Learning Products. Expansion reference sections on every lesson page cover grammar, illustrated vocabulary and communicative functions. An extensive Total Support Audio Program models American English pronunciation for developing confidence in speaking and listening in various settings.

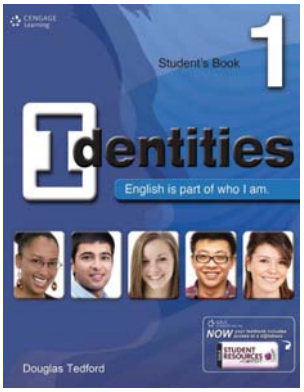
Unique links in every lesson to Gale's Student Resources in Context online database provide enrichment and enhance the value of the core course. The integrated Student's Book includes Activity Pages, a Grammar Roundup, Reading Synthesis pages, and an Evaluation and Reflection section to close each block. The Total Support Teacher's Guide offers guidelines for lesson planning, classroom management, testing, cooperative learning, and effective parental involvement.

Competencies and the Common European Framework of Reference (CEFR)

Identities uses a competencies-based methodology and approach. Competencies are indicators of students' abilities to apply learning to solve a real-world, or simulated real-world problem. Teachers will recognize that Identities is fully competency-based, using contemporary approaches for learning English. Generic Graduation Competencies and Basic Discipline Competencies were identified and fulfilled for each block. Competencies are fully-referenced and integrated into each block. Performance objectives, grammar and vocabulary are also indexed.

Identities Student's Book 1 is aligned to levels A1 (Breakthrough) to A2 (Waystage) of the Common European Framework of Reference for Languages (CEFR). Although Book 1 of the course is oriented to Basic Speakers, it acknowledges experiences, practice and skills students may have acquired in previous coursework, while reinforcing and introducing beginning language forms, vocabulary and functions for total novices to English Language Learning.

Levels 2 (A2), 3 (A2 to B1) and 4 (B1) prepare students for incremental mastery of all four language skills. Learning Products, the end goal of each block, are simulated real-world challenges which increase in complexity in each level of *Identities*. *Identities* 1 – 4 prepares students for the potential successful




completion of standardized English tests required for admission to some vocational or university programs.

Principles of Constructivism and Constructivist Language Teaching

As the precursor of competencies, and other standards for lesson development, Identities is designed around principles of constructivist language teaching that inform language teaching standards in many nations. Constructivist language teaching is not a method, rather an approach, to teaching languages, which is eclectic, meaning all methods for teaching languages and other content areas may be incorporated as part of the process.

A key characteristic of constructivism is the emphasis on learning with a purpose of applying skills and knowledge to create a Learning Product. The learning product should represent original work, insights or new knowledge that can benefit, enrich or empower self and others. Lesson activities may be completed individually, in pairs or in cooperative groups. The three-phase learning cycle of Experience, Practice and Apply is embedded in the Suggested Lesson Schedule. The Secretaria de Educación Publica (SEP), Mexico's Department of Education, is presently employing standards for constructivist language teaching which had been employed in three US states since the 1980's. Hence, *Identities* is built around those specific principles, utilizing the theories and practices of Stephen Krashen and Jim Cummins.

Krashen's Monitor Hypothesis (1981, 1982) aligns with the constructivist principles of experience, practice and application which form the basis for this course. His model represented the first comprehensive application of constructivism for language learning in US public schools. It emphasized the importance of providing comprehensible input – meaningful experiences tied to language symbols – as the basis for learning and reproducing language patterns for application to real life.

Krashen's theories aligned with the work of Cummins (1979, 1982) that emphasized providing experiences of Common Underlying Proficiency when teaching a language. Students of a foreign language (L2) learn quicker and retain more through concepts previously contemplated in the native language (L1). In *Identities*, the task of teaching English is met in one way by presenting social and vocational themes of high interest to students with picture vocabulary as support.

Throughout the lessons, students are provided ample contextual cues via audio and graphics, to comprehend and complete the tasks requested of them. The great value of infusing students with comprehensible input at regular intervals through the lesson cycle is that it equalizes opportunities for students to understand what is expected of them and provides options for deciding about how to construct the Learning Product.

Identities and Universal Design of Learning (UDL)

There are a lot of questions expecting the student to respond with personal opinions and experiences in the text, helping learners draw meaning from activities to describe who they are, their demographics, goals and plans, physical appearance, families, hobbies, favorites, jobs, friends, physical surroundings, communities, and nationalities. As opposed to traditional English acquisition books where one starts out by learning the rules and structural elements of the language, this author designed the text by utilizing key components of cognitive psychology to draw upon the background knowledge of the learners in order to help them internalize what they are learning (Willingham, 2009). As evident in many high school foreign language courses, the surface teaching may lead to certain level of proficiency, but learners seldom attain the competencies they need to adequately use the language

to speak, write, or think. Content only matters when the information learned can be processed, applied, retained, and generalized with some ease.

The core design of this text is based primarily on the three key principles of universal design pedagogy of (1) multiple means of representation (various ways of acquiring information and knowledge), (2) multiple means of expression (alternative for demonstrating what students know), and (3) multiple means of engagement (tap into learners' interests, challenge them appropriately, and motivate them to want to learn). Universal Design of Learning (UDL) is a practical, research-based approach for responding to not only to issues of the *what* (content) of teaching but also to the *how* (pedagogy), and the *why* (emotion and intention) of teaching (Rose & Meyer, 2002). Presently, *Identities* is the only text that offers an extensive ICT component directed to the Mexico ELT (English Language Teaching) market. Naturally, *Identities* models a blueprint for the modern adaptation of instruction to meet the diverse needs of learners in acquiring a foreign language.

Course Organization and the Role of Educational Technology

Each class period is defined as a Day, and is designed to last from 40 to 50 minutes. Each Block is comprised of 12 Days. Each level of Identities is comprised of 4 Blocks, representing a total of 48 Days, consistent with teaching 3 Days per week, during a 16-week semester. Exercises are designated in two categories: Learning Support Tasks- a menu of activities to prepare the student for essential learning activities- and Core Tasks, comprising essential learning activities.

The focus of *Identities* on completion of the Learning Product as the central focus of each block aligns fully with contemporary discourse about Problem-Based Learning (PBL) units, which, like the Learning Product, can be completed individually, in dyads, or in small groups and can be enhanced through the use of Educational Technology, including accessing of resources through the Internet. ICT usage is recommended but optional in *Identities,* including exploration of Gale Student Resources in Context and the creation of Wikis for storing of ePortfolios.

In the course, active use of the Internet and other educational technologies is a recommended optional practice that fortifies completion of the Learning Product. ICT Connections boxes feature Gale Student Resources in Context, a password-linked database – free with book purchases – which provides access to English-language articles, videos, and other listings. The site may be accessed for a full semester of study after the student registers on line.

A guide to Internet Safety and index of Internet Resources fortifies understanding of online practices, and includes a menu of educational technology sites of the most value to teachers and students. Included are links for English practice, translation, online communication, audio and video development and Wikis – free personal sites which students may use to store and comment on documents, including ePortfolio items.

Afterword

Identities is one of the few English language books in the market that presents materials using a combination of audio modeling of American English speakers, lesson links, database of enrichment exercises, and a total support teachers' guide which provides time-tested examples and classroom management strategies. Its writing is concise, the text richly-illustrated, the materials well-organized and the standards of learning carefully laid out.

What I appreciate most about *Identities* is that it shows the teacher how to create a classroom in which students can actively experience, experiment, and discover a foreign language with success! It systematically applies sound pedagogies and educational technology in the most innovative ways to motivate foreign language learners and enhance their learning experience.

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Identities: English is part of who I am. Four-semester ELT series for high schools. ISBNS for Books 1 and 3:

IDENTITIES STUDENT'S BOOK 1	9786074815733
IDENTITIES STUDENT'S BOOK 3	9786074815764

Instructional Design and Technology professionals in higher education: Multimedia production knowledge and skills identified from a Delphi study

William Sugar, East Carolina University; Abbie Brown, East Carolina University; Lee Daniels, East Tennessee State University; Brent Hoard, East Carolina University

Abstract: This study reports on the results of a recent Delphi study in which eleven Instructional Design and Technology professionals working in a higher education setting identified key multimedia knowledge and skills required of entry-level Instructional Design and Technology professionals. Responding initially to three, open-ended questions, this Delphi panel distinguished and ranked seventy unique items. Results are summarized and discussed. The authors also reflect upon how the results of this study initiated recent curricular revisions to their respective multimedia production courses. Future studies and directions on understanding how best practices involving multimedia production skills also are proposed.

Keywords: Instructional Design, Professional Preparation, Instructional Technology, Instructional Media Production

As Instructional Design and Technology (ID&T) educators, we have made considerable effort in understanding the specific multimedia production knowledge and skills required of entry-level professionals. Our previous studies (Sugar, Brown, & Daniels, 2009) documented specific multimedia production skills, knowledge and software applications (e.g., Flash) that ID&T students and subsequent graduates need to exhibit. As a result of these efforts, differences can be readily distinguished between instructional designers working in corporate settings and those working in higher education settings (Sugar, Hoard, Brown, & Daniels, 2011). Kirschner, van Merrienboer, Sloep, and Carr (2002) observed that instructional designers at higher education settings focus identifying alternative solutions for a particular course whereas instructional designers within a corporate training setting are more customer-oriented. Larson and Lockee (2009) concurred with this assessment by noting "differences in the requirements listed for business and industry versus higher education jobs" (p. 2). Essentially, the organizational culture (e.g., shared beliefs and values) within a corporation is radically different than that which is found within a college or university setting. Since over 89% of our initial survey respondents (e.g., Sugar, Brown, & Daniels, 2009) worked in colleges or universities, we decided to concentrate our efforts exclusively on the multimedia production knowledge and skills of instructional designers working within higher education.

The role of the instructional designer, instructional technologist, and instructional technology consultant within a higher education setting has been well established. Recent studies have documented several quality instructional technology-related projects within higher education settings (e.g., Renes & Strange, 2011). As one might expect, teaching online has been emphasized during the past fifteen years

(e.g., Barczyk, Buckenmeyer, & Feldman, 2010), as well as mobile learning technologies (e.g., El-Hussein & Cronje, 2010) and online student response systems (e.g., Stav, Nielsen, Hansen-Nygård & Thorseth, 2010). Other innovative technologies, such as interactive white boards (e.g., Al-Qirim, 2011), social networking (e.g., Conole, Galley, & Culver, 2011), Web 2.0 tools (e.g., Kear, Woodthorpe, Robertson, & Hutchison, 2010), and 21st century tools for teacher educators (e.g., Archambault, Wetzel, Foulger, & Williams, 2010) have been integrated in higher education classrooms. Several case studies document the inclusion of instructional technologies into content-specific higher education courses, such as art and design education (e.g., Delacruz, 2009), engineering (e.g., Dinsmore, Alexander, & Loughlin, 2008), and nursing (e.g., Donato, Hudyma, & Carter, 2010). "Soft" technologies, such as mentoring circles (Darwin & Palmer, 2009) also have been successfully integrated in higher education settings.

The prominence of the instructional designer within higher education settings also has been well documented (Shibley, Amaral, Shank, & Shibley, 2011). Incorporating a continuous improvement process (Wolf, 2007), encouraging higher education faculty with innovative reward and recognition structures (Bluteau & Krumins, 2008), and the importance of interacting with faculty peers (Nicolle & Lou, 2008) are examples of current best practices in facilitating successful technology adoption and integration. Considerable effort in understanding how higher education faculty adopt e-Learning activities (e.g., MacKeogh & Fox, 2009), Web 2.0 technologies (e.g., Samarawickrema, Benson, & Brack, 2010), as well as faculty members' perceptions of roles of Learning Content Management Systems (LCMS) (e.g., Steel, 2009) have been recently initiated as well.

Purpose of Study

The intent of this study is to better comprehend the instructional designer's role in higher education settings. Specifically, we sought to interpret multimedia production knowledge and skills required of Instructional Design and Technology professionals working in higher education. In addition, since we noted a definite interrelationship between multimedia production and instructional design skills in earlier studies (Sugar, Brown, & Daniels, 2009), we also sought to understand the relationship between these two skill sets. To accomplish this goal, we conducted a Delphi study, seeking the opinions and consensus of experienced instructional designers who work in higher education.

Method

We determined that a Delphi research methodology was the best approach to address our questions. In the early 1950's, "Project Delphi" was developed from an Air Force-sponsored Rand Corporation study. This study sought to "obtain the most reliable consensus of opinion of a group of experts ... by a series of intensive questionnaires interspersed with controlled opinion feedback" (Linstone & Turoff, 2002, p. 10). Delphi panelists remain anonymous to each other in order to avoid the "bandwagon effect" and ensure individual panelists do not dominate a particular decision (Linstone & Turoff, 2002). Ideally, the Delphi panel is heterogeneous; clearly representing a wide selection of the targeted group. Since the inception of Project Delphi, the Delphi technique has been a prescribed methodology for a wide variety of content areas, including government planning, medical issues, and drug abuse-related policy making (Linstone & Turoff, 2002). Several existing Instructional Design and Technology research studies utilized the Delphi method to examine phenomena such as: determining constructivist-based distance learning strategies for school teachers (Herring, 2004); understanding strategies that promote social connectedness in online learning environments (Slagter van Tryon & Bishop, 2006); best practices for using technology in high schools (Clark, 2006); optimal technology integration in adult literacy classrooms (Dillon-Marable & Valentine, 2006); and forecasting how blended learning approaches can be used in computer-supported collaborative learning environments (So & Bonk, 2010). The Delphi method has also been used to identify priorities from a select group of experts on topics that include K –12 distance education research, policies, and practices (Rice, 2009); mobile learning technologies (Kurubacak, 2007); and educational technology research needs (Pollard & Pollard, 2004).

Standards have also been determined from Delphi studies. Researchers used this method to ascer-

tain effective project manager competencies (Brill, Bishop, & Walker, 2006), biotechnology knowledge and skills for technology education teachers (Scott, Washer, & Wright, 2006), and assistive technology knowledge and skills for special education teachers (Smith, Kelley, Maushak, Griffin-Shirley, & Lan, 2009).

This Delphi research method is an established technique to collect a consensus decision among experts about a topic that involves examination of a broad and complex problem that could be potentially subjective (Linstone & Turoff, 1975; Linstone & Turoff, 2002). The question of which multimedia production knowledge and skills are important among entry-level instructional designers is both complex and subjective; the answer depends on decisions made within organizations and the learner population the organization services.

The Delphi method provides researchers with the ability to systematically evaluate the expert decision-making process within a prescribed set of phases. This process is particularly advantageous for those participants or Delphi panelists who are in separate physical locations (Linstone & Turoff, 1975), as our participants were.

Delphi Panel

For our Delphi study, fourteen Instructional Design and Technology professionals originally agreed to participate. Ultimately, eleven of the fourteen original panelists completed all three data collection phases of the study; three individuals stopped participating for various personal reasons. The overall goal was to gather responses from a heterogeneous grouping of panelists (see Table 1) representing higher education work environments in general. The seven female and four male panelists work in a variety of higher education settings, including two-year colleges, four-year universities, public institutions, and private institutions. Eight of our panelists represent public institutions and three represent private institutions. In addition, two panelists represent two-year community colleges and four represent undergraduate-only institutions. Nine of our panelists work in administrative positions (e.g., Director) and two of our panelists work as instructional designers for their respective institutions. Ten panelists have worked in higher education setting for more than ten years. The average amount of higher education work experience was over sixteen years. The panelists are geographically diverse, representing western, mountain west, mid-west, south, southeast, mid-Atlantic, and northeast regions of the United States. One panelist works at a higher education institution in Switzerland.

Overview of Delphi Data Collection Phases

Three Delphi data collection phases were completed during this study. During the first round, panelists responded to the following three open-ended questions:

- What multimedia production knowledge do you believe an entry-level Instructional Design and Technology professional needs to know in order to be successful?
- What multimedia production skills do you believe an entry-level Instructional Design and Technology professional must possess in order to be successful?
- What kind of overlap is there between multimedia production knowledge and skills and instructional design knowledge and skills?

The purpose of these questions was to delineate specific multimedia production knowledge and skills, required of these professionals. The questions were open-ended in order to avoid biasing our panelists' responses (Linstone & Turoff, 1975). The panelists responded to these questions via email.

With the intent of identifying emerging and reoccurring themes, three evaluators analyzed the panelists' responses using a category construction data analysis method as outlined by Merriam (2009). Questionable items and themes were discussed among the three evaluators; the evaluators reached consensus on all items. Particular themes from these responses were identified. This initial set of themes was sent to the panelists for their review. Each panelist had the opportunity to respond to the overarching group of themes and the specific themes, and to add additional categories as well. All of these themes were compiled into a

Table 1: Demographic information of Delphi panelists

Gender	*Position*	*Years in higher education setting*	*Region*	*Type of institution*
Female	Instructional Designer	10	West	Public; 4-year degree; Undergraduate & graduate
Female	Instructional Designer	12	Mountain West	Public; 4-year degree; Undergraduate & graduate
Female	Coordinator	4	Northeast	Public; 4-year degree; Undergraduate
Female	Coordinator	27	Southeast	Public; 2-year degree; Undergraduate
Female	Vice Provost	25	South	Public; 4-year degree; Undergraduate & graduate
Male	Director	29	Midwest	Private; 4-year degree; Undergraduate
Male	Chief Academic Officer	20	South	Public; 2-year degree; Undergraduate
Male	Director	19	Southeast	Private; 4-year degree; Undergraduate & graduate
Female	Director	14	Mid-Atlantic	Public; 4-year degree; Undergraduate & graduate
Male	Director	11	Switzerland	Public; 3-year degree; Undergraduate & graduate
Female	Team Leader	13	Northeast	Private; 4-year degree; Undergraduate & graduate

summative questionnaire, and this questionnaire was then distributed during the second round.

The intent of the questionnaire was to establish a quantitative appraisal of our panelists' responses about each item and to seek a common set of responses to Instructional Design and Technology graduates' multimedia production knowledge and skills. The panelists rated each questionnaire item with regard to the importance of each identified knowledge or skill, and the panelists' responses were compiled and distributed via email to each panel member. Panelists were then given the opportunity to offer feedback about the questionnaire results and make any corrections, as necessary.

During the third round, the eleven panelists reviewed the Round #2 ratings and were given the opportunity to revise their own ratings. Five of the eleven panelists recommended minor incremental changes to their original rankings. None of the eleven panelists made any suggestions to either add another item or remove an existing item. Given this feedback, we determined that these minor modifications indicated there was an apparent consensus among the panel.

Results

During the initial Delphi phase, the eleven panelists generated 289 unique statements regarding the three aforementioned initial questions. From this first round of responses, 60 distinct multimedia knowl-

Table 2: Top-ranked items (M ≥ 1.45)

Rank	*Item*	*Category*	*f*	*M*	*SD*
1	Communication skills	Communication and collaboration	11	1.91	.30
2	Social skills	Communication and collaboration	11	1.73	.65
3	Web design basics	Production	11	1.64	.51
4	Visual communication	Visual and graphic design	10	1.60	.70
5	Microsoft Office Suite	Applications	11	1.55	.52
6	Online course pedagogy	Instructional design and pedagogy	11	1.55	.69
7	Knowledge of learner	Instructional design and pedagogy	11	1.55	.82
8	Screencasting	Production	11	1.45	.69
9	Pedagogical design of the	Instructional design and pedagogy	11	1.45	1.21
10	Design multimedia content	Instructional design and pedagogy	11	1.45	.82
11	Articulate advantages & disadvantages of delivering media formats	Delivery and project management	11	1.45	.69
12	Determine delivery venue	Delivery and project management	11	1.45	.52
13	Understanding of how disabilities impact multimedia selection	Delivery and project management	11	1.45	.69
14	LCMS	Online Applications	11	1.45	1.21
15	Video production	Production	11	1.45	.52

Responses were rated on a scale of -2 to 2, with -2 = unnecessary, -1 = not important, 0 = somewhat important, 1 = important, 2 = essential.

edge and skills needed by Instructional Design and Technology graduates were identified and organized into seven primary categories. This list of categories was then sent back to our panelists for confirmation. Eight of the eleven panelists recommended ten additional knowledge and skills for a total of 70 items.

The panelists also reacted to the seven categories. Four original categories (Visual and Graphic De-

Table 3: Bottom-ranked items (M ≤.36)

Rank	*Item*	*Category*	*f*	*M*	*SD*
60	XML	Online Applications	11	.36	.81
61	Online plug-ins	Online applications	11	.27	1.27
62	Online quiz tools	Online applications	11	.18	1.08
63	Contribute	Online applications	10	.10	1.10
64	Photography	Production	11	.09	.94
65	Online survey tools	Online applications	11	.09	.94
66	Animation	Production	11	.00	.63
67	Garageband	Applications	11	.00	.63
68	Final Cut Pro Suite	Applications	11	-.09	.94
69	Programming (e.g., Action-script)	Production	10	-.10	1.10
70	Green screen	Applications	10	-.40	1.27

Responses were rated on a scale of -2 to 2, with -2 = unnecessary, -1 = not important, 0 = somewhat important, 1 = important, 2 = essential.

sign, Instructional Design and Pedagogy, Communication and Collaboration, and Delivery and Project Management) did not receive any feedback or edits and were approved. The panelists commented on the three original categories: Basic Production, Specific Software Tool and Online. Upon review of these comments, these categories were renamed Production, Applications, and Online Applications respectively. We distinguished between applications (e.g., Flash) that can create instruction for online settings as well as non -online settings, and applications (e.g., Dreamweaver) that exclusively create instruction for online settings.

In summary, Delphi panelists' responses were organized into seven categories: Production (10 items), Applications (12 items), Online Applications (15 items), Visual and Graphic Design (6 items), Instructional Design and Pedagogy (15 items), Communication and Collaboration (4 items), and Delivery and Project Management (8 items) See Appendix for a listing of these categories and corresponding items. .

During the next Delphi phase, our eleven panelists ranked these seventy items on the following scale: Essential, Important, Somewhat important, Not important, Unnecessary. Accordingly, we assigned a 2 to -2 Likert scale for these five items where Essential items received 2 points, Important items received 1 point, Somewhat important items received 0 points, Not important items received -1 point, and Unnecessary items received -2 points. Thus, the top score any item could receive would be 22 points (i.e., all 11 panelists deemed this item to be Essential) and the lowest score that an item could receive would be -22 points (i.e., all 11 panelists deemed this item to be Unnecessary). This rating system also provides the ability to weight and counterweight individual panelists' responses about a particular item. For example, if a panelist rated one item as Important (1 point) and another panelist rated the same item as Not important (-1 point), the item would receive a combined score of zero points and would be considered as Somewhat important.

The average scores for all of the seventy items ranged from M = 1.91 to M = -.4 (see Appendix). The fifteen top-ranked items that received a 1.45 average or higher are found in Table 2. The top two items, Communication (M = 1.91, SD = .30) and Social skills (M = 1.73, SD = .65) were within the Communication and Collaboration category. Three production items, Web Design Basics (M = 1.64, SD = .51), Video Production (M = 1.45, SD = .52), and Screencasting (M = 1.45,

Table 4: Percentage of importance within each category

Category (n)	*Unnecessary to Not important* $-2 \leq M < -1$ %	*Not important to Somewhat important* $-1 \leq M < 0$ %	*Somewhat important to Important* $0 \leq M < 1$ %	*Important to Essential* $1 \leq M \leq 2$ %
Communication and collaboration (n=4)	0.0	0.0	25.0	75.0
Visual and graphic design (n=6)	0.0	0.0	0.0	100.0
Delivery and project management (n=8)	0.0	0.0	12.0	88.0
Instructional design and pedagogy (n=15)	0.0	0.0	20.0	80.0
Production (n=10)	0.0	10.0	30.0	60.0
Online applications (n=15)	0.0	0.0	66.7	33.3
Applications (n=12)	0.0	16.67	66.66	16.67
Totals (n=70)	0.0	4.3	37.1	58.6

SD = .69) were including in this top-ranked list. The item, Visual communication and visualization theories (M = 1.60, SD = .70), was the fourth highest-ranked item and Microsoft Office Suite (M = 1.55, SD = .52) was the fifth highest-ranked item. Four of the fifteen Instructional Design and Pedagogy items and three of the eight Delivery and Project Management items also were distributed in this top-ranked listing. Learning Content Management Systems (LCMS) (M = 1.45, SD = 1.21) also was in this top ranking list. The eleven bottom-ranked items that received a .36 average or lower are found in Table 3. Five Online applications (XML, Online quiz tools, Online plug-ins, Contribute, and Google Forms/Survey Monkey) were located in this list of items. Three Production items (Photography, Animation, and Programming) and three Applications items (Garageband, Final Cut Pro, and Green screen) received an average of 0 or lower.

In Table 4, the percentage of importance ratings is listed for each category. Over sixty percent of the items (63.8%) from each of the seven categories received an "Important" ($M \geq 1$) to "Essential" ($M \leq 2$) ranking. All the *Visual and Graphic Design* (n=6) items were within this range. Fourteen of the fifteen *Instructional Design and Pedagogy* items received "Important to Essential" ratings; SCORM received an average score lower than 1 ($M = .73$, $SD = .91$). Three of the four *Communication and Collaboration* items also received "Important to Essential" ratings. Public presentation skills received an average score lower than 1 ($M = .91$, $SD = .94$). All but one *Delivery and Project Management* item (n=7) also received an "Important to Essential" rating; Understanding of budget constraints & funding issues received an average score lower than 1 ($M = .64$, $SD = .81$).

Sixty percent of the Production items (n=6) received an "Important" ($M \geq 1$) to "Essential" ($M \leq 2$) rating (see Table 4). A majority of the Delphi panelists categorized Web design basics ($M = 1.64$, $SD = .51$), Video production ($M = 1.45$, $SD = .52$), Screencasting ($M = 1.45$, $SD = .69$), Audio production ($M = 1.36$, $SD = .67$), Images production ($M = 1.36$, $SD = .67$), and Basic HTML commands ($M = 1.09$, $SD = 1.10$), as "Important" to "Essential" items. (see Table 5). The

Table 5: Production category items

Rank	*Production category items*	*f*	*M*	*SD*
3	Web design basics	11	1.64	.51
8	Screencasting	11	1.45	.69
15	Video production	11	1.45	.52
16	Audio production	11	1.36	.67
26	Images production	11	1.36	.67
38	Basic HTML commands	11	1.00	1.10
48	Desktop publication	11	.91	.75
64	Photography	11	.09	.94
66	Animation	11	.00	.63
68	Programming skills (e.g., Actionscript)	10	-.10	1.10

Responses were rated on a scale of -2 to 2, with -2 = unnecessary, -1 = not important, 0 = somewhat important, 1 = important, 2 = essential.

Table 6: Application category items

Rank	*Application category items*	*f*	*M*	*SD*
5	Microsoft Office suite	11	1.55	.52
33	Adobe software suite	11	1.09	.94
47	Major operating systems	11	.82	1.08
49	Photoshop	11	.82	.87
51	Audacity	11	.73	.79
56	Adobe Flash	11	.64	.93
57	Adobe Acrobat	11	.55	1.04
58	iMovie	11	.55	.82
59	Fireworks	11	.55	.93
67	Garageband	11	.00	.63
68	Final Cut Pro Suite	11	-.09	.94
70	Green screen	10	-.40	1.27

Responses were rated on a scale of -2 to 2, with -2 = unnecessary, -1 = not important, 0 = somewhat important, 1 = important, 2 = essential.

remaining four Production items either received a "Somewhat important" ($M \leq 0$) to "Important" ($M \leq 1$) ranking (i.e., Desktop publishing and Photography) or received a "Not important" ($M \leq -1$) to "Somewhat important" ($M \leq 0$) ranking (i.e., Animation and Programming skills).

Only 25% of the Application items (n=3) received an "Important" ($M \geq 1$) to "Essential" ($M \leq 2$) rating (see Table 6). Two of these three applications are generic applications with regard to multimedia production items. These applications are Microsoft Office suite ($M = 1.55$, $SD = .52$) and Major operating systems ($M = 1.00$, $SD = 1.08$). The other Application item is the overall Adobe software suite ($M = 1.09$, $SD = .94$). The remaining nine Application items either received a "Somewhat important" ($M \leq 0$) to "Important" ($M \leq 1$) ranking (i.e., Audacity, Flash, Photoshop, Acrobat, iMovie, Fireworks, and GarageBand) or received a "Not important" ($M \leq -1$) to "Somewhat important" ($M \leq 0$) ranking (i.e., Final Cut Pro and Green screen).

There is disagreement among the panelists regarding the importance of specific applications. As depicted in Figure 1, at least 45% of the panelists perceived the importance of the following three applications: Flash, Photoshop, and Fireworks. Six panelists perceived Flash as either an *Important* or an *Essential* multimedia production item whereas five panelists perceived Flash as either *Somewhat important* or *Not important*. Five panelists perceived both Photoshop and Fireworks as either an *Important* or an *Essential* multimedia production item whereas six panelists per-

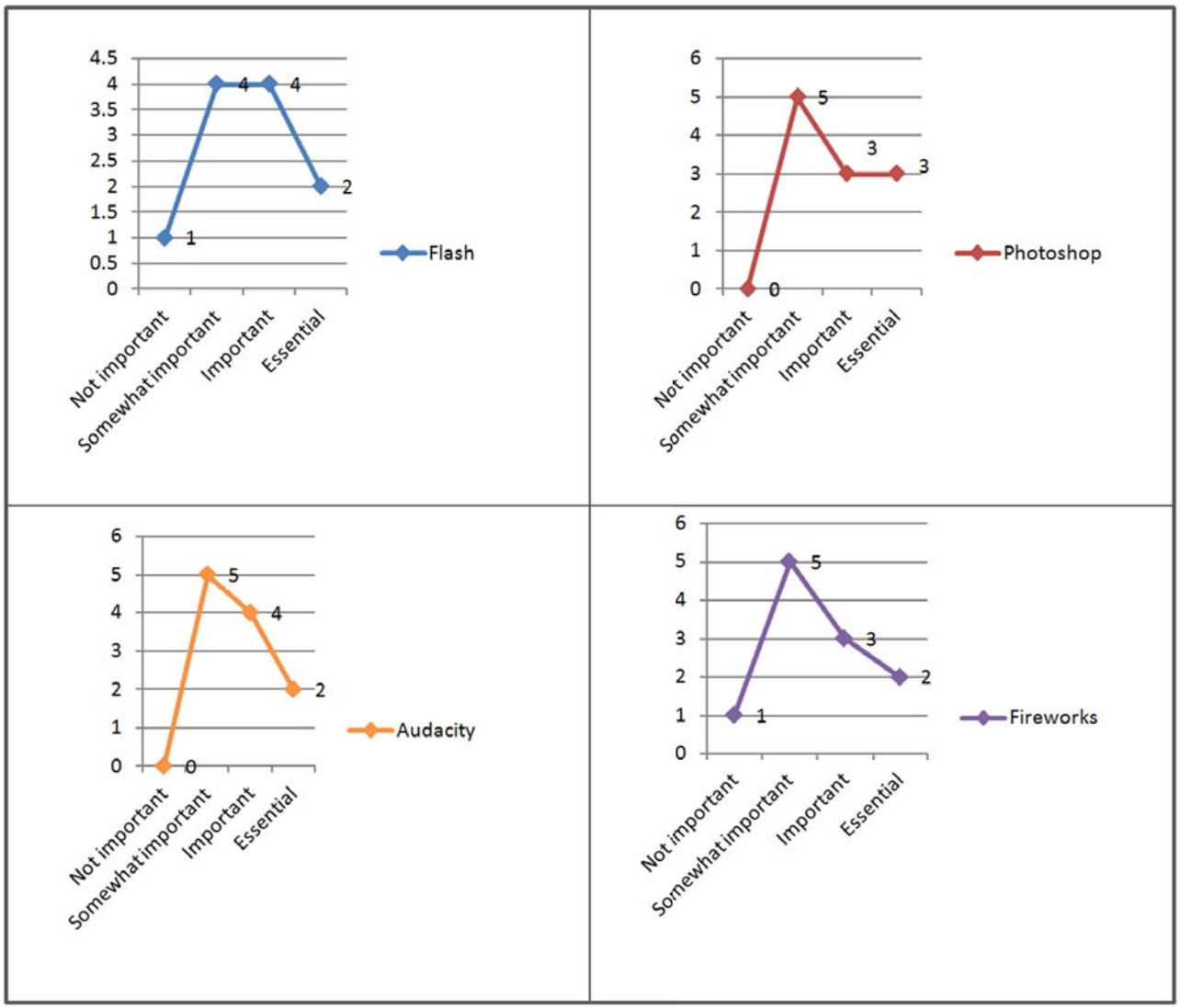

Figure 1: Respondents' discrepancies amongst *Application* category items

Table 7: Online application category items

Rank	*Online application category items*		*M*	*SD*
14	LCMS	11	1.45	1.21
29	Web 2.0 applications	11	1.27	.79
34	Knowledge of online file structures	11	1.09	.94
39	Camtasia	10	1.00	.82
40	Web page editors	11	1.00	.78
44	Dreamweaver	11	.91	.83
29	Web 2.0 applications	11	1.27	.79
45	CSS	11	.91	.70
50	Wikis	11	.82	.75
53	Captivate	11	.64	.67
55	Blogs	11	.64	1.12
60	XML	11	.36	.81
61	Online plug-ins	11	.27	1.27
62	Online quiz tools	11	.18	1.08
63	Contribute	10	.10	1.10
65	Online survey tools	11	.09	.94

Responses were rated on a scale of -2 to 2, with -2 = unnecessary, -1 = not important, 0 = somewhat important, 1 = important, 2 = essential.

ceived both Photoshop and Fireworks as either *Somewhat important* or *Not important*.

Thirty-three percent of the Online application items (n=5) received an "Important" ($M \geq 1$) to "Essential" ($M \leq 2$) rating (see Table 7). Four of these five applications are generic applications with regard to multimedia production items. These applications are LCMS ($M = 1.36$, $SD = 1.21$), Web 2.0 applications ($M = 1.27$, $SD = .79$), Knowledge of online file structures ($M = 1.09$, $SD = .94$), and Web page editors ($M = 1.00$, $SD = .78$). The other Online application item is Camtasia ($M = 1.00$, $SD = .82$). The remaining ten Application items received a *"Somewhat important" ($M \leq 0$) to "Important" ($M \leq 1$)* ranking.

Similar to the Application items, there is disagreement among the panelists regarding the impor-

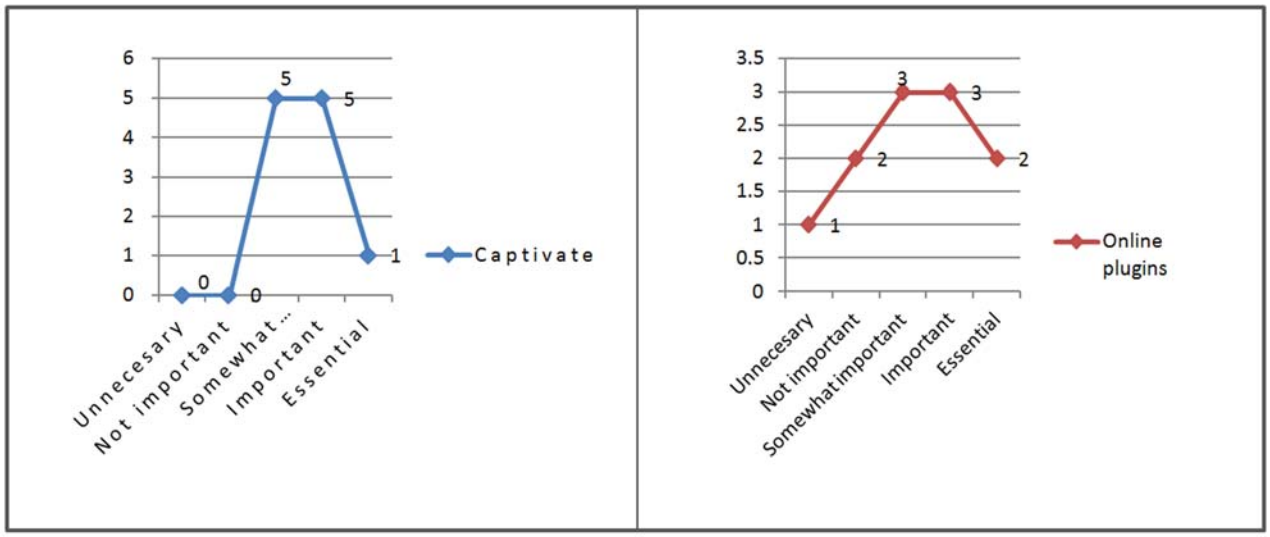

Figure 2: Respondents' discrepancies amongst *Online application* category items

tance of particular online applications. As shown in Figure 2, at least 45% of the panelists perceived the importance of the following two applications: Camtasia and Online plugins. Six panelists perceived Camtasia as either an *Important* or an *Essential* multimedia production item whereas five panelists perceived Camtasia as either *Somewhat important* or *Not important*. Five panelists perceived Online plugins as either an *Important* or an *Essential* multimedia production item whereas six panelists perceived these tools as either *Somewhat important, Not important* or *Unnecessary*.

Discussion

In considering these results, the Delphi panelists identified specific multimedia production skills and knowledge needed by entry-level Instructional Design and Technology (ID&T) professionals who work in higher education settings. These skills and knowledge include the following: generalized multimedia production knowledge and skills, emphasis of online learning skills, and the interrelationship between multimedia production and instructional design skills. After describing these skills and knowledge, we discuss how these results have influenced our own respective curricular practices, as well as anticipate future research studies that would provide additional understanding on how best to educate instructional designers working in higher education settings.

The Delphi panelists undoubtedly came to consensus that ID&T graduates need to be well-versed with a number of general multimedia production skills. Visual design principles, video production and audio production skills all were ranked high and were considered *Essential* by a majority of the panelists. Conversely, more advanced and specialized technologies (e.g., programming and green screen technology) are not as important and were ranked as *Unnecessary*. Also, there is a conclusive preference among the panelists regarding online learning applications and skills. Web design basics, online course pedagogy, screencasting, and LCMS skills all were ranked as *Essential*. It is interesting to note that no specific computer-based instruction application besides Camtasia and Dreamweaver received an *Essential* or *Important* ranking. In fact, Delphi panelists were divided on the importance of specific software applications, including: Flash, Photoshop, Audacity, Fireworks, and Captivate.

In addition to these essential multimedia production skills, the panelists' rankings indicate an interrelationship between instructional design skills and multimedia production skills. Even though panelists were asked about ID&T graduates' multimedia production knowledge and skills, eighty percent of the items from the Instructional design and pedagogy category (e.g., Knowledge of learner characteristics, Determining the appropriate delivery venue for particular content area, etc.) were ranked as *Essential*. Furthermore, Communication skills and Social skills were ranked first and second, respectively. This finding implies that ID&T entry-level professionals need a robust combination of general multimedia production skills and knowledge and overall instructional design skills and

knowledge.

Implications

As Instructional Design and Technology faculty members, we were intrigued to receive these results from our panelists and are now considering curricular revisions for our respective courses. The results from our study indicate that multimedia production items cannot be taught in isolation and should not be linked to a particular software application. In previous semesters, our respective multimedia production courses were the default software application course (e.g., Flash, Authorware, Director, etc.). Currently, our students now use "lowest common denominator," computer-based instruction applications (e.g., PowerPoint) to teach particular computer-based instruction methodologies (e.g., tutorial). Our respective students are introduced to innovative technologies (e.g., Prezi), but the emphasis is not solely on the particular authoring tool, but on how to integrate this tool into overall, existing instructional modules. To highlight the interrelationship between multimedia production and instructional design skills, our students are now required to complete instructional design reports when creating a multimedia production project. We view these projects as instructional design "experiments" and students complete "lab reports" with each project.

The panelists' respective rankings and results also indicate additional areas to explore with regards ID&T graduates' overall multimedia production and instructional design skills and knowledge. Inquiry into the changing role of the instructional designer with respect to these two skill sets, such as Schwier and Wilson's (2010) recent study should take place. A more in-depth understanding of what Willis (2009) refers to as process instructional design, such as a study on the best practices involving collaboration between instructional designer and client is encouraged as well. In addition, case studies on how instructional designers effectively balance multimedia production and instructional design skills should be developed. These case studies could be used as instructional tools to teach novice instructional designers best practices in integrating multimedia production skills within an overall instructional design project.

In summary, the results from this Delphi study indicate that Instructional Design and Technology professional working in higher education settings need to be educated about overall multimedia production skills and how these skills interrelate to their set of instructional design skills. As Instructional Design and Technology educators, we look forward to considering innovative and effective approaches to our respective curricula and to continuing this dialogue with other Instructional Design and Technology educators.

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Appendix: Delphi panelists' responses and categories

Rank	*Items*	*Category*	*f*	*M*	*SD*
1	Communication skills	Communication and collaboration	11	1.91	.30
2	Social skills	Communication and collaboration	11	1.73	.65
3	Web design basics	Production	11	1.64	.51
4	Visual communication and visualization theories	Visual and graphic design	10	1.60	.70
5	Microsoft Office Suite	Applications	11	1.55	.52
6	Online course delivery	Instructional design and pedagogy	11	1.55	.69
7	Knowledge of learner characteristics	Instructional design and pedagogy	11	1.55	.82
8	Screencasting	Production	11	1.45	.69
9	Pedagogical design of the instructional content	Instructional design and pedagogy	11	1.45	1.21
10	Design multimedia content according to learners' defined needs	Instructional design and pedagogy	11	1.45	.82
11	Articulate different advantages & disadvantages of delivering media formats	Delivery and project management	11	1.45	.69
12	Determine delivery venue for content area	Delivery and project management	11	1.45	.52
13	Understanding of how disabilities impact multimedia selection	Delivery and project management	11	1.45	.69
14	LCMS	Online Applications	11	1.45	1.21
15	Video production	Production	11	1.45	.52
16	Audio production	Production	11	1.36	.67
17	Visual design basics	Visual and graphic design	11	1.36	.67
18	Digital media design	Visual and graphic design	11	1.36	.51
19	Message design	Visual and graphic design	11	1.36	.81
20	Pedagogy of course delivery	Instructional design and pedagogy	11	1.36	1.21
21	Knowledge of learning styles	Instructional design and pedagogy	11	1.36	.81
22	Understand the learning needs of clients	Communication and collaboration	11	1.36	1.21

Appendix: Delphi panelists' responses and categories

23	Project planning and management	Delivery and project management	11	1.36	.81
24	Time Management	Delivery and project management	11	1.36	.81
25	Knowledge of copyright issues	Delivery and project management	11	1.36	.67
26	Images production	Production	11	1.36	.67
27	Online instruction	Instructional design and pedagogy	11	1.36	1.21
28	Assessment	Instructional design and pedagogy	11	1.27	1.19
29	Web 2.0 applications	Online Applications	11	1.27	.79
30	User interface	Visual and graphic design	10	1.20	.63
31	Creative vision	Visual and graphic design	11	1.18	.87
32	Storyboarding	Instructional design and pedagogy	11	1.18	.60
33	Adobe software suite	Applications	11	1.09	.94
34	Knowledge of online file structures	Online Applications	11	1.09	.94
35	508 compliant content	Instructional design and pedagogy	11	1.09	1.04
36	Knowledge of basic ID models	Instructional design and pedagogy	11	1.09	1.30
37	Multitasking	Delivery and project management	11	1.00	.89
38	Basic HTML commands	Production	11	1.00	1.10
39	Camtasia	Online Applications	10	1.00	.82
40	Web page editors	Online Applications	11	1.00	.78
41	Evaluate existing product for its educational value	Instructional design and pedagogy	11	1.00	1.18
42	Teaching	Instructional design and pedagogy	11	.91	1.14
43	Mastery of general education theoretical principles	Instructional design and pedagogy	11	.91	1.22
44	Dreamweaver	Online Applications	11	.91	.83
45	CSS	Online Applications	11	.91	.70
46	Public presentation	Communication and collaboration	11	.91	.94
47	Major operating systems	Applications	11	.82	1.08
48	Desktop publication	Production	11	.82	.75

Appendix: Delphi panelists' responses and categories

49	Photoshop	Applications	11	.82	.87
50	Wikis	Online Applications	11	.82	.75
51	Audacity	Applications	11	.73	.79
52	SCORM	Instructional design and pedagogy	11	.64	.81
53	Captivate	Online Applications	11	.64	.67
54	Understanding of budget constraints & funding issues	Delivery and project management	11	.64	.81
55	Blogs	Online Applications	11	.64	1.12
56	Adobe Flash	Applications	11	.64	.93
57	Adobe Acrobat	Applications	11	.55	1.04
58	iMovie	Applications	11	.55	.82
59	Fireworks	Applications	11	.55	.93
60	XML	Online Applications	11	.36	.81
61	Online plug-ins	Online Applications	11	.27	1.27
62	Online quiz tools	Online Applications	11	.18	1.08
63	Contribute	Online Applications	10	.10	1.10
64	Photography	Production	11	.09	.94
65	Google Forms/Survey Monkey	Online Applications	11	.09	.94
66	Animation	Production	11	.00	.63
67	Garageband	Applications	11	.00	.63
68	Final Cut Pro Suite	Applications	11	-.09	.94
69	Programming (e.g., Actionscript)	Production	10	-.10	1.10
70	Green screen	Applications	10	-.40	1.27

Collaborative Games: An Exploratory View for Instructional Designers

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Abstract: This action-research study examines the value of collaborative gaming in team-based work environments, as a means of team building and collaboration. Based on findings from survey, interview, and literature review, the potential value of videogames was confirmed in support of workplace collaboration. A growing number of workers are experienced gamers – and even those less experienced can contribute in positive ways to collaborative games-based activities. Examples are provided to illustrate ways that games can be productively used in the workplace.

Keywords: team building, collaboration, videogames, instructional design

Recently, I received some fantastic feedback from a team member. While I knew the expectations for this particular project, I misunderstood a few of the more nuanced aspects of our goal. The feedback my team member provided helped me see my mistakes clearly without making me feel inferior; the collaboration helped define my role more specifically so I could support my teammates. My understanding clear, we forged on to complete our objective: the final boss in Blackrock Caverns, a five-player dungeon in the massively multiplayer online role-playing game, *World of Warcraft.*

Games have provided pivotal learning experiences for me. Whether team dynamics from *World of Warcraft*, critical thinking and strategy skills from *Final Fantasy Tactics*, or the importance of clear and effective communication from *Modern Warfare 2*, games have taught me skills beyond the stories and gameplay. My experience is not unique. Gamers everywhere have synthesized these experiences into tangible skills that benefit the organizations for which they work. Video games are no longer a niche hobby for kids and computer geeks. A multi-billion dollar industry, well-known game releases can rival the revenue of blockbuster movies and platinum records. Video games have broken into the mainstream.

Instructional designers seek to implement new forms of training to improve the success of employees. Teamwork is a commonly cited issue among managers and business owners; team members often feel that more vocal members overshadow their ideas, or that teamwork slows down processes, rather than positively informing the project. A paradigm shift is necessary: gaming may provide the framework for collaboration needed for instructional designers to help improve team member buy-in and productivity.

Just as movies and television have informed training practices in new ways, instructional designers must start using video games as a valuable facet of training and learning. As new waves of people native to

digital and interactive media enter the workforce, team collaboration and practices change; training and learning environments have largely remained the same. The business world faces an imminent paradigm shift among its workers brought on by the advent of the digital age. The potential cost of failing to make this shift is high: communication among team members may become increasingly difficult; productivity may suffer from the lack of a unified identity; feedback may become forced and unnatural; and workers may feel division between those who wish for more digitally relevant opportunities and those who are satisfied with the status quo. *In this article I examine the value of collaborative gaming in team-based work environments as a medium for team building and collaboration.*

Research Questions

These research questions evolved over the course of data collection. I adjusted the questions to better suit my research goals and collection methods, and subsequently gathered more valuable data.

- How accurate is the popular expectation of demo graphics for gamers?
- What collaborative skills can games teach or enhance that would be valuable in a professional setting?
- How can video games provide learning experiences that are more valuable than traditional methods?
- How open are workers to learning and collaborating in such a different context?

Method

The study was an action-research project involving survey and interview methods along with a review of literature. I interviewed David Aregood of *Popsy Interactive,* a smartphone app company with an emphasis on gaming during live entertainment events. Surveys were a valuable course of action for qualitative research, and I implemented surveys on Facebook with responses from friends and family (*Game Experience and Online Usage Survey)*, as well as with *Multi-Chem's* training center in Houston, Texas (*Implementing Games as a Collaborative Tool Survey)*. A group of professionals acted as a focus group, playing the games that I anticipated would add value to team training practices.

Participants

Participants came from a variety of sources. This benefited the purpose of the study, given the wide range of experiences associated with gaming and business. All participants were interested and invested in the outcomes of the research.

Multi-Chem, a chemical company in Houston, Texas, participated in a survey regarding its openness to learning team-building skills using collaborative games. The training development manager consented to send the survey to employees who work in teams and who would find the survey relevant and engaging.

My interview with David Aregood regarding *Popsy's* market research and product goals provided useful information regarding the expected demographics of gamers and how games offer discovery-based learning environments at the entertainment level that would be valuable to implement in team-based work environments. This interview provides insight into the consumer gaming market and the manner in which organizations may be able to tap into congruent models for training purposes.

The survey conducted on Facebook informed my research from a broader scope of demographics, engaging people of both genders as well as from different generations.

The gaming focus group consisted of a group of professionals with whom I am acquainted from a variety of professional backgrounds. The group consisted of an instructional designer, a teacher, a web designer, and an office manager. Two participants were men and two were women; two participants were in the 18-34 demographic, while the other two were in the 45-54 demographic. Each participant was interested in the outcome of the experience and had varying levels of experience with video games–from avid to absent.

Data Collection

Table 1 comprises the research questions, method of research, rationale for use, and sampling plan.

Data Analysis

Most of my data was qualitative in nature, save perhaps the data obtained from an interview with David Aregood. Because of this, the analysis primarily

Table 1: Methods for Addressing Research Questions

Research Question	Method of Research	Rationale	Sampling Plan
How accurate is the popular expectation of demographics for gamers?	Interviewed David Aregood of *Popsy Interactive* regarding market research; data from *Game Experience* Survey	Information from a gaming professional and multi-generational users to dispel the "basement gamer" myth	Contacted upon referral from a mutual friend based on similar professional interests
What collaborative skills can games teach or enhance that would be valuable in a professional setting?	Focus group of professionals for gaming to record critical reflections and insights	Direct data from people who would be impacted by the implementation of gaming in training curricula	Approached individual professionals from unique contexts within my circle of influence
How can video games provide learning experiences more valuable than in traditional methods?	Focus group of professionals for gaming to record critical reflections and insights	Practical element to the report–how video games can improve existing practices	Approached individual professionals from unique contexts within my circle of influence
How open are workers to learning and collaborating in such a different context?	Facilitated *Implementing Games as a Collaborative Tool* Survey	Assessed the likelihood of actual implementation and gauged potential employee buy-in	The survey was distributed to all employees at the training center over a two week period

focuses on reporting the reaction of my participants in relation to possible implementation of collaborative gaming in training programs. This information did not give me proof of success, but rather the likelihood of success or participation and the ability to either recommend or dissuade from implementation.

The data for both surveys was compiled and reported through Google Forms. I recorded the information from the focus group using a simple table listing game played, reflections, and recommendations for use.

The interview with David Aregood was conducted through email correspondence. I provided a set of ten questions that introduced the work of *Popsy Interactive* and addressed the indicated research questions. Using these tools, I answered my research questions using formats that were appropriate for the data being collected.

I analyzed the collected data in conjunction with my literature review; each informed the other and ultimately created a cohesive approach by which to answer my research questions. First, the survey for *Multi-Chem* provided relevant data from a specific organization; this helped to ground my findings and make them directly relevant to instructional designers, as opposed to having theoretical information that could not end in a plan of action. Next, the survey conducted through Facebook provided a multi-generational perspective useful for changing the perception of the stereotypical gamer. This data helps provide the rationale for my entire report, in that it helps open up the realm of video games to a broader professional audience. Whereas the Facebook survey helped diversify my research, my interview with David Aregood gave industry-specific insights into discovery learning, game design, and demographics from the entertainment standpoint– data that helped bridge the gap between the worlds of game development and instructional design. Finally, the video game focus group offered a more personal and practical perspective; the

reflections brought both affirming insights and cautionary observations that helped clarify the need and process to implementing video games in team-building.

Findings

I began a review of literature with a book by Jane McGonigal: *Reality is Broken: Why Games Make Us Better and How They Can Change the World.* This book received press recently from both proponents and skeptics, and was thus a logical place to begin. The book exposed me to other valuable researchers and resources, which I used to inform my keyword and database searching. I also chose a few resources from David Thomas' *Games and Learning* course, in which I am currently enrolled. I used the EBSCO database to find reliable journal articles; my keyword searches included the following: World of Warcraft, collaboration and video games, team building, cooperation, and shared intentionality. I also chose a few specific game and educational theorists to look up, including James Paul Gee, Nick Yee, and Robert Drake. Lastly, I used Google Scholar to find a specific article by Gee. My searches proved fruitful on all fronts; my literature review is a narrative framework and rationale for the use of games as a tool for team building based on reliable sources and empirical data gathered during the course of my collection period.

Defining "Games"

Games may be defined as activities with rules that connect the real and the fictitious–through fun–to accomplish an inherent goal or achieve an outcome. While many consider the concept of "rules" to be inhibitive, rules are a necessary element of games that provides the framework for creativity and expression (Bogost, 2007). Rules give the player a world full of self-imposed obstacles to overcome; since no one forces the player to play, the obstacles become a source of accomplishment and success unrivaled by any obstacles imposed by an external authority (McGonigal, 2011). It is this drive to succeed—framed by rules and fostered by self-imposed obstacles—that give gamers the drive to continue gaming. Another way to explain the relationship between the game and the gamer is to break games down into their basic elements: mechanics, dynamics, and aesthetics, or MDA (Hunicke, LeBlanc, and Zubek, 2001). *Mechanics* defines the world and provide limitations on paths to success, rules, and the overall objective of the game. *Dynamics* describes how the player manipulates and interacts with the rules to achieve the intended outcome. A*esthetics* describes the look and feel of the game, specifically the user experience and enjoyment.

A necessary distinction should be made between games and simulations: games include "fun" as a necessary component, while simulations do not. Drake, Goldsmith, and Strachan (2006) describe a project to teach teamwork to graduate students in which they participate in a business simulation designed to reproduce "working in a team under pressure" (p.37). The simulation wasn't intentionally fun; while the simulation was deemed successful overall, one student left his group and many felt extreme pressure to succeed. Games inherently provide opportunities to solve problems, overcome obstacles, and be creative—all desirable traits for team-building practices.

How Games Affect Us

Jenova Chen, a game developer who focuses on developing games that reach a broad audience and elicit an emotional response from the gamer, developed a PC and PS3 game called f*lOw*, in which the player controls an aquatic microorganism that evolves as players fluidly move between levels. Chen drew inspiration from the psychological mindset of the same name, in which the person shows continuous and singular engagement in the task. Athletes call it "the zone," and it is one of two positive responses that gamers feel when they achieve a goal in a game, the other of which is *fiero,* or "what we feel after we triumph over diversity" (McGonigal, 2011, p.33). Gamers primarily draw satisfaction from these two states.

World of Warcraft (WoW*)* is a prime example of the positive effects of gaming on an individual. McGonigal (2011) sites *WoW* as a phenomenon of satisfying work: "Gamers have collectively spent 5.93 million years [playing *World of Warcraft*]" (p.52). Gamers spend so much time playing *WoW* because at its core, *WoW* is about self-advancement and improving one's character: leveling up, learning professions, participating in raids to earn better equipment, and so forth. What players love most in the game would typically be considered work—*WoW* offers a system of work that is satisfying and fun (McGonigal, 2011). Nick Yee (2006)—a researcher in MMORPGs, or *Massively Multiplayer Online Role-Playing Games*—found that "real-life skills can be acquired or improved upon in these environments," referring to online team-

based experiences (p.323). Specifically, Yee (2006) found that a combined 50.3 percent of participants learned leadership skills from playing MMORPGs like *WoW* (p.323). Games make us feel good about ourselves and provide opportunities for growth. The benefit of gaming cooperatively with others is apparent.

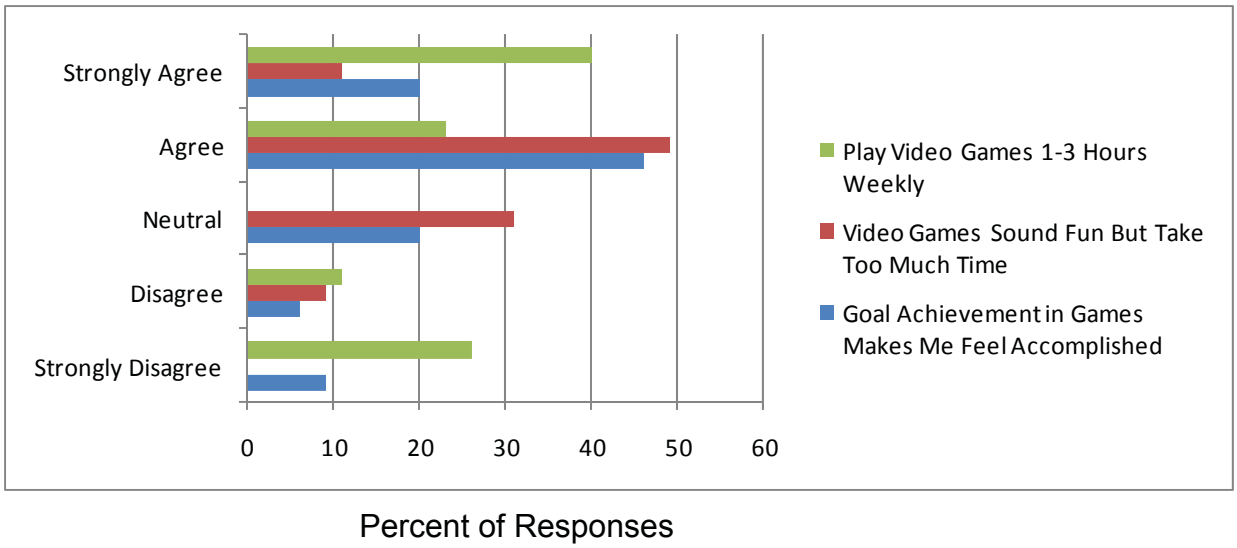
In the focus group I conducted with four people of different professional backgrounds (instructional designer, teacher, web designer, office manager) the experiences and critical reflections on *Worms: Armageddon* generated by participants focused on how failure in the game creates optimism for future success. *Worms* is a game where the players each have four worms to control and the goal is to be the last one standing. While the common expectation would be that players be competitive, the opposite was true: the payoff isn't winning, but experiencing the ridiculously over the top explosions and funny animations that happen when someone gets hit--even one's own worm. Because of this, failure on the part of the participants created optimism and a desire to help the other players make better decisions in subsequent turns. Collaboration happened naturally because each player was invested in the successes and failures of the others. This drive to improve, even in the face of failure, is a highly sought after trait among teams; *Worms Armageddon* helped the participants experience that feeling, and bond as a team quickly because of it.

Games at Work

The number of people who identify themselves as gamers has grown: 69 percent of heads of household play video games; 97 percent of youth play video games; and one out of four gamers is over the age of fifty (McGonigal, 2011, p.11). The average age of people who play video games is thirty (Yee, 2006, p.312). People who identify themselves as gamers are no longer just the stereotypical geek in the basement; games have broken into the mainstream. The survey I conducted on game experience and online usage was open to all generations through Facebook; 35 people responded over the course of the two weeks in which the survey was open. The data defies the anticipated demographics for gamers: 60 percent of respondents agreed that many video games sound fun, but require too large of a time investment. This would not be the expected response from the stereotypical gamer. Sixty-six percent of respondents agree that completing a goal in a game makes them feel accomplished. Finally, 63 percent of respondents confirmed that they play video games at least one to three hours weekly. The graph in Figure 1 compiles the data.

One may conclude that since a majority of respondents play video games at least one to three hours weekly but consider many video games unreasonable due to the required time investment, the time spent playing is, on some level, productive–

Figure 1. Survey findings relating to feelings, attitudes, and game-playing activity.



specifically that many respondents feel accomplished after playing. This would also suggest a broader scope for the gamer demographic than popular opinion would expect; the stereotypical gamer is not expected to question gameplay based on time investment and associated feelings of accomplishment.

Several organizations have chosen to utilize games as a way to provide content for employees. One such company, Sun Microsystems—now a part of Oracle—implemented two games, *Dawn of the Shadow Specters* and *Rise of the Shadow Specters*, that teach employees to adopt company values (Penenberg, 2009). Since introducing fun and exploratory learning can greatly enhance the user experience, it is likely that employees were more enthusiastic about the content and synthesized it more effectively. Kurt Squire (2008), a researcher in game design and education, notes that many organizations want immersive experiences in which their employees can learn: context trumps content (p.16). This is pointedly important with younger generations of the work force who have grown up learning by experience online; discovery is an expected medium for learning. Traditional instructional designers work from a top-down information dispersal model, whereas the new media landscape embraces "open access to information, flexibility, nonlinearity, user autonomy, customization, and permeable boundaries" (Squire, 2008, p.30). The contextual, discovery based learning opportunities presented by video games make sense to implement from both the perspective of the intended user and the instructional designer. If the goal is to deliver content effectively, then methodologies should change with the times. Video games are a next step, and they hold particular value in team-based settings.

In my interview with David Aregood of *Popsy Interactive*–a web app company that delivers a game layer to sports events through smart phones–we discussed how Popsy would allow users to interact with other users through issuing challenges and sharing results:

While playing our game, we have the ability to create what we call a Popsy Posse. This allows you to issue a challenge to a friend or multiple friends and compete for points while watching a particular game. We have also initiated a dynamic on our website that allows players to communicate or leave messages with each other or invite others through social media outlets such as Facebook and Twitter.

Though *Popsy* is a consumer-based product and is not designed for use in training settings, it illustrates the possibilities of gaming as a way to interact in a new way with one's environment; this is essentially discovery based learning. Users answer questions relevant to the events they watch; rather than a sports announcer sharing statistical information or trivia, users discover it themselves by participating in a game. This format of information acquisition is becoming both increasingly more prominent and important in training and learning environments; organizations would do well to adopt *Popsy's* model.

Video Games and Team Building

Games provide many opportunities to develop and enhance teamwork and leadership skills. Yee (2006) focuses on MMORPGs, in which he notes such skills as "role assignment, task delegation, crisis management, logistical planning, and how rewards are to be shared among group members" (p.323). Most of the MMORPGs chosen for study required a subscription fee to play at the time (p.314), and thus may not be a viable option for companies to use for team-building exercises. However, many other multiplayer and cooperative games exist in entertainment that may prove valuable for such endeavors.

New Super Mario Bros.(*NMSB*) for the Nintendo Wii, is one such game that turned out to be a fun and productive choice for my focus group participants. The game is what anyone familiar with the franchise would expect: players take Mario (or Luigi or a Toadstool, up to four players) through eight worlds of side scrolling levels, each with unique themes and challenges. In *NSMB*, players can be a hindrance to each other if not careful–a change made for the Wii version of the game so player have to strategize and work together to beat each level. In one instance of such a hindrance, Mario jumped off of Luigi's head to prevent falling and losing a life; however Luigi just lost a life in his place. Coordination is key in *NSMB*, as all participants learned quickly. Another potential downfall: acquiring power-ups. Each power-up block contains four, one for each player. However, one player can retrieve all four, rendering the other players depowered. These obstacles promote clear verbal communication and collaboration to beat each level–skills valuable for team-building as well.

McGonigal (2011) attributes three subgroups to collaboration: cooperating, coordinating, and co-creating (p.268). Multiplayer games promote these facets naturally. For instance, in a round of Team Deathmatch in *Modern Warfare 2*, teammates must *cooperate* to discover and assault enemy strongholds; *coordinate* to cover all possible escape routes while managing bullet and grenade supply; and *co-create* by pooling total kills to receive a game advantage not attainable by oneself (and hopefully win the round). Focus group participants were invested in the success of other participants in *Modern Warfare 2* because the success of the team determined the success of the individual. Other game modes played in *MW2* were less valuable; for instance a regular Deathmatch game is every man for himself; the "optimistic failure" effect of *Worms* was absent in *MW2*, primarily because the payoff lay in earning points by eliminating other players, not in enjoying the visuals. Rather, participants became frustrated with each other, driven by bragging rights and proving prowess rather than having mutual investment in the outcome. Not all multiplayer game modes are equally valid team-building tools; even within the same game, as *MW2* shows, some modes may even be counterproductive. Instructional designers must be selective about the games and modes they choose to use in training.

James Paul Gee (2004) offers another perspective in that the gamer collaborates with the game designer to create the virtual environment. In essence, the gamer brings the world which the designer created into being—a form of co-creation. SCE (Sony Computer Entertainment) expands this relationship in their Play, Create, Share initiative with games such as *Little Big Planet 2* and *ModNation Racers*. Both games center around user-generated content: players create avatars, racetracks, and levels to share with other players who then assign value to the content using a five star system and an adjective cloud system, in which players use descriptive words for the content which others can see. In this sense, the user is helping the designer to co-create and rate content. These collaboration skills, while fun and valuable in-game, must be translated to real world environments to make these skills worthwhile for organizations. Drake, Goldsmith, and Strachan (2006) share the evaluation process from their business simulation exercise: a questionnaire promoting reflection on the process and how the simulation affected the participants' understanding of teamwork (p.41). Participants must critically reflect to facilitate skill transfer. Other important elements include: disciplinary discussion between game goals and project goals; consistency in play for further development; a conducive environment for expression during the experience; and an experienced instructional designer to facilitate the process until discourse becomes natural.

Such critical reflections happened naturally in my focus group; since participants knew the purpose of the group, they were thinking critically about the process as a whole and as individuals. We discussed skill transfer extensively since the goal of the focus group was to observe teamwork skills experienced and to discuss how those skills could transfer to teamwork environments. During play, I noted that players created clearly defined roles for each other that the whole team agreed upon without hesitance. If a certain tactic wasn't working, the team would brainstorm other options and come to a consensus before the next try. This happened both with *New Super Mario Bros.* and *Modern Warfare 2*, the two cooperative games I chose.

I also noticed that when the experienced gamers helped teach inexperienced players, the learning curve became substantially smaller–specifically with controller use and button layouts. Both of these observations can be attributed to the players having a unified vision for a single task. The task was clear in each scenario: beat the level before time runs out, take out the guards silently to prevent detection, and so on.

Participants were invested in the success of their teammates. Upon reflection with the group, we determined that "fun" was the factor that made each participant so invested; they wanted to beat the level or achieve the next goal, which they couldn't do without the help of teammates. One participant thought that our reflection time would help her be more conscious of the teamwork principles she experienced in her own professional setting. Overall, participants thought that their time spent playing was valuable, and that it would translate well to team-building training at their respective jobs. Table 2 shows the games played, critical reflections, and recommendation for use.

Video games are, from design up, valuable mediums for learning skills desired by a variety of organizations. The literature–and the data I gathered–supports that collaborative games, when used with specific learning goals in mind, can provide the kind of context-important learning environment that can transform teamwork.

Table 2. Summary of games reported by participants.

Game Played	Critical Reflections	Recommendation for Use
Worms: Armageddon	Failure creates optimism	Yes, as an introduction to collaborative gaming
Modern Warfare 2	Invested in team success; natural role assignment	Yes, only if game modes are chosen intentionally
New Super Mario Bros.	Coordination and team problem solving	Yes, as a regular tool to build teamwork

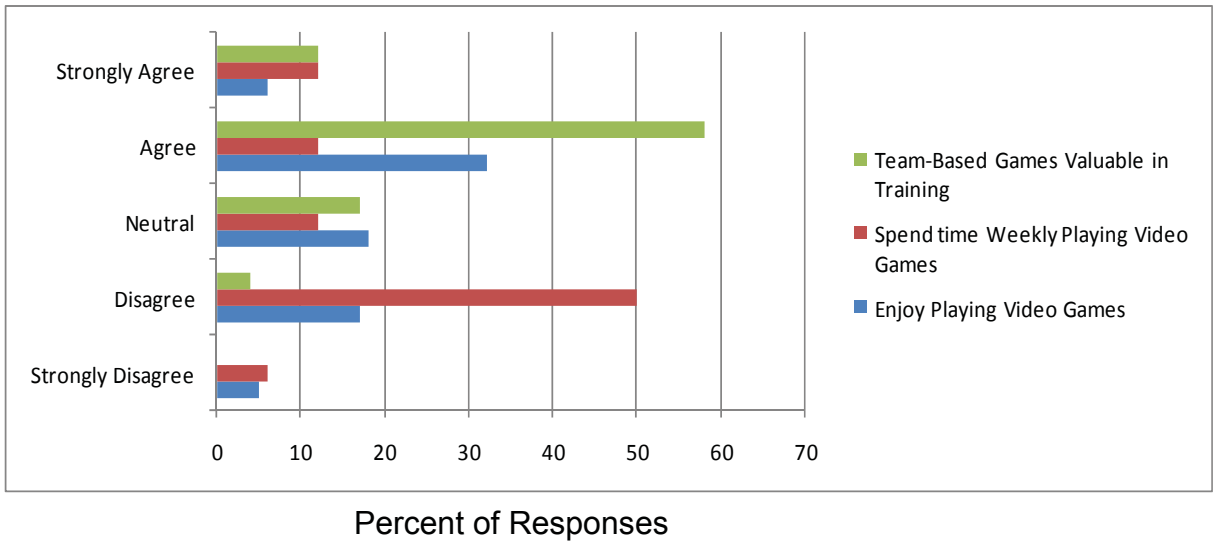
Openness to Change

The consulted articles favored implementing video games in training. In particular, Squire (2008) indicates three game design companies that have been contracted to develop games as learning tools for organizations: Breakaway Games, Root Learning, and YaYa Media. While the literature suggests that implementation is valuable, I have found no literature regarding employee openness to such a change in procedure. Through the survey I conducted with *Multi-Chem*, I gathered some compelling data. Of the 24 respondents, 41 percent enjoy playing video games; a combined 69 percent were either neutral or disagreed. Seventy-one percent were either neutral or disagreed that they spend time weekly playing video games. However a combined 71 percent of respondents agreed that team-based games could be valuable in a training setting. The data is presented in Figure 2.

This shows that while the majority of respondents do not regularly play video games, they recognize the potential of video games to aid team training. Additionally, 91 percent of respondents are open to non-traditional methods of learning if proven effective. This solidifies that, in *Multi-Chem*, surveyed employees would be open to using video games in training.

Though Yee's (2006) research on gamer motivation in MMORPGs may prove a valuable resource to promote collaborative games in training, it does not directly address the manner in which teams and organizations can utilize those motivations. Regardless, the literature and survey are clear: collaborative video games are assets in the workplace.

Figure 2. Survey findings for game enjoyment, time, and perceived value.



Conclusion

This study supports the relevance of video games for collaborative learning in a variety of workplace contexts. As per my research questions, I determined that most gamers don't fit the popular stereotype of kids and computer geeks, as supported by my research and the literature. *Gamer* increasingly describes a wider variety of people. Most surprisingly, a majority of participants feel accomplished after playing video games. The focus group observations confirmed that skill transfer from games is possible, and may even be more likely than in traditional team-building methods. When players share a fun experience, they become mutually invested in the outcome. This context-centric learning provides opportunities to both hone old skills and learn new ones. Such skills include: defining member roles, constructive criticism, developing a unified vision, and notably, the ability for failure to create optimism. Finally, I discovered that even if employees may not spend personal time playing games, they recognize the benefit of games in team-building and would be open to using them during training.

Though my findings were conclusive, any instructional designers interested in applying my findings should note the limitations. I did not measure gender and age demographics; if one's organization leans heavily toward a single demographic, further inquiry would be necessary to determine the potential success of learning with collaborative games. Additionally, if instructional designers are not gamers themselves, this plan of action could quickly go awry. Familiarity with the content is vital. I would suggest testing different games to see what works and to ensure that the instructional designer can adequately articulate and guide the process for learners.

I encourage instructional designers to pursue similar research in their individual contexts to assess the likelihood of implementing a collaborative games learning environment. I would further recommend that learning specialists examine existing training practices to ensure contextual learning; my research and the literature both suggest that content synthesis happens more naturally when information is applied in authentic contexts, not merely delivered. For teams, this is pointedly important; with many different perspectives, teamwork can quickly turn more competitive than collaborative. Video games provide a viable option for employees to smoothly transition into a team.

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