Citations as a Key to Identity in the Field of Instructional Design Technology

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In recent decades, many people have studied the identity of the field of Instructional Design and Technology (IDT) (Bichelmeyer, Boling, Gibbons, Grabowski, Hill, Osguthorpe, Schwier, & Wager, 2002; Jones, 1999; Rieber, 1998; Seels & Richey, 1994), in order to understand this emerging discipline more completely. Defining the field is itself a difficult prospect. Circumscribing a space that includes all educational technology, instructional technology, instructional systems, instructional design, training, and similar disciplines becomes in itself a difficult task.

In this study we examine the field of instructional design specifically, but even within instructional design there is confusion. Campbell, Schwier, and Kenny (2005) state, "The instructional design field has long debated the nature of instructional design practice. Is it a craft? Is it a science? Is it an art?" (¶1) The practice of the field is reflective of the identity issues which face the discipline and its theorists.

Among the large number of previous studies focusing on refining the identity of the field, very little research has looked at citation analyses (Kirby, Hoadley, & Carr-Chellman, 2005) and none to date that we are aware of has examined frequently cited publications thematically as a window into the IDT field's interests and enduring subject matter. We attempt to fill this gap by examining often cited works of major theorists in IDT and discussing these publications with those theorists to understand their perceptions of what their work means to IDT trends and issues.

We are motivated by a straightforward re-search question: "What are the perceptions of leading scholars on their most often cited works as a reflection of the identity of the IDT field?" After a brief review of the literature on previous research in related topics, we present the methods used in the study, followed by the discussion of our findings. Although the participants of this study are all scholars in North America, international publications and scholars were included in the initial search. We suspect that this study, like many such studies, is biased toward a U.S. perspective either because of the search engine selected or the manner in which well-known scholars in major IDT programs were identified. It is possible, for example, that by using search programs that conform to U.S. naming conventions we were more likely to find scholars who reside in the U.S. Thus, we recognize as an important limitation the U.S. nature of the work, but we hope that perhaps the work can be extended by either a theoretical comparison by researchers more knowledgeable about the nature of the international field, or by a empirical replication of this study on an international scale.

Literature Review

For quite a long time there have been discussions on what terms should be used to define this field (e.g., educational technology, instructional design, instructional technology, instructional systems, and so forth). Studies concerning this definition have been conducted by investigating many aspects of the field, including the development of graduate programs for preparing instructional designers (Hartt & Rossett, 2000; Klein, Brinkerhoff, Koroghlanian, Brewer, Ku, &

MacPherson-Coy, 2000), graduate students' perceptions of the field (Smith, Hessing, & Bichelmeyer, 2004), international standards of the field (IBSTPI, 2005), and ethical issues (Bichelmeyer et al., 2002).

The identity issues which face our field may be contextualized in the age of the field itself. Most IDT histories tell us that the field stems from significant investments in technologies as teaching tools for military applications in the 1940s and '50s (Saettler, 1990). In essence, the IDT field is facing its adolescence, having gone beyond the infancy and glowing expectations of technologists with stars in their eyes. We have arrived at the precipice of identity crisis. Brent Wilson (2005) has characterized this crisis as a choice between broadening or narrowing our field. "Recent years have seen significant growth in the field of Instructional Design and Technology (IDT), but at the same time a splintering of effort and loss of control over research and professional activity" (Wilson, 2005, ¶ 1). Being able to harness the energy that Wilson suggests is released when a field faces exponential growth into productive, and dare we say emancipatory, activity will yield a deeper and clearer understanding of who we are as a field. This study is limited in many ways and we are not suggesting that this small contribution will offer a clear resolution to our identity issues, but rather that it will deepen our understanding of our identity as seen by leaders in the field.

Clarifying the philosophical foundations of IDT can help people improve both research and practice (IBSTPI, 2005), a challenge given that some of the fundamental principles of the IDT field have changed over time and will continue to change, including the culture of the community, the theoretical foundations, and principles for practitioners (IBSTPI, 2005). Through the years, diverse opinions about what "good" instruction should be has changed as the IDT field absorbed knowledge and theories from other fields, including computer science, psychology, and communication. Media research, drawn from audiovisual research, is certainly a foundation of IDT. We have moved from the development of curricular materials in the late '60s to computer technology and instructional design in the '70s and now, to a focus on cognitive learning theories and constructivism (Bichelmeyer et al., 2002). Theories that support IDT practice and appropriate research methods and topics have changed accordingly. As a result, it is important for members of the IDT field to be aware of both hot and classical topics under the umbrella of shared knowledge.

While theories and research from different fields have brought new topics and directions for research and practice in IDT, they have also introduced an increasing number of talented theorists, researchers and practitioners. For this reason, there are continuing debates on who is "in" and who is "out" (Merrill, Drake, Lacy, Pratt, & ID2 Research Group at Utah State University, 1996). Merrill et al. (1996) set a conservative boundary for this community, including only those scholars and practitioners who practice the *science* of the field. For the purpose of this study, we maintain a fairly open or inclusive sense of who "belongs" in IDT as a field or discipline.

Different aspects of our field's identity have been studied in prior research, including scholars' productivity (Hannafin, 1991), the changing culture of the IDT field (IBSTPI, 2005), and the main body of the IDT community (Merrill et al., 1996). However, an investigation of critical notions of the field exemplified by the most cited publications among leading scholars is lacking in our current literature. There are several related studies involving citations of scholars in the field. Kirby, Hoadley, and Carr-Chellman (2005) did an empirical citation analysis of the relationship between the IDT field and the Learning Science field. Carr-Chellman (2006) conducted a document analysis that studied the publication patterns of successful emerging scholars in the field. Other studies examined issues related to citations of leading scholars' publications, including Cotton and Anderson, 1973; Myers and Delevie, 1966; Rice, Borgman, and Reeves 1988; and Sachs, 1984. Most of these related studies focused on the content of the publications and citations that revealed trends in the field, rather than examining the trends through the authors' perceptions of their most cited publications. These related studies have helped immensely in the illumination of the identity of the IDT field. We are interested in developing another angle on the question—in the service, perhaps, of multiple perspectives.

Method

This study was conducted in two phases: article identification and interviews. Article identification was based on two functions of citation analysis: 1) trying to find out how much impact a particular article has had by showing how many other authors have cited it (see accompanying appendix), and 2) trying to determine more about a field or topic (Garfield, 1972). Bauer and Bakkalbasi's study (2005) found that Google Scholar is used widely as a citation search tool, and that it typically includes recent citation counts. Accordingly, we decided to use Google Scholar to search out

the most cited works of each leading scholar in the IDT field. In-depth interviews would then provide us a basic and necessary understanding for our second step (Seidman, 2006).

Bauer and Bakkalbasi (2005) suggest that newer materials (from around year 2000) receive higher citation counts in Google Scholar than in either Web of Science or Scopus, so a Google Scholar search was likely to reveal traditional journal articles and unique materials. In addition, Google Scholar offers citation tracking as well as citation counts (Bauer & Bakkalbasi, 2005). We examined the work of 37 well-known scholars in major and secondary IDT programs. We compared the citations and citation frequencies retrieved through Google Scholar to the same search with Web of Science and obtained the same similar citation frequencies.

We identified a list of thirteen scholars and their most frequently cited works, using around 100 citations for a given article or book as our criterion for inclusion. We felt this represented a high rate of citation and therefore indicated a strong interest in that topic. We also found a precipitous drop after that 100-citation point which indicated that the thirteen scholars produced the most cited works. Twelve of these scholars were from U.S. universities and one is from abroad. Accessibility issues prevented us from making contact with the international scholar. An email was sent to the other twelve scholars inviting them to participate in phone interviews, and a follow up email was sent after one month. After two requests for participation, nine scholars agreed to join our study as the subjects. We conducted telephone interviews with six of the nine willing respondents; the other three were unavailable for interviews due to scheduling conflicts, a common limitation in studies involving busy professionals. Most of our respondents wanted to read our study results before they were published.

According to the scholars' preference and availability, we conducted either telephone interviews or interviews through online voice communication such as Skype or instant messenger. During our pre-interview contact with the six scholars, two asked us for interview questions in advance for preparation and another wanted to answer our questions through email. However, in order to maintain spontaneity and standardization of method, we did not offer the questions in advance or allow email exchanges. This method also allowed us to ask follow-up questions to spontaneous responses during the interviews (Rubin & Rubin, 2005; Seidman, 2006). During this second phase of our study, we asked authors to reflect on their highly cited works. Our interview protocol was composed of six questions:

1. Did you expect this article would be your most cited work? Why/Why not?
2. How do you feel about this work? Is it among the least or most favorite works you've contributed to the field? Why?
3. Who do you think has cited this article most? Faculty? Graduate Students? Practitioners?
4. Do you see this work as a "classic" or a "hot topic"?
5. What do you think this article or book has contributed to the field?
6. What do you think the popularity of this article or book says about the field? About our identity as a field?

The interviews lasted approximately 30-60 minutes. After the qualitative data was collected, the interviews were transcribed and themes were identified and coded. We followed a two-phase data analysis process in the responsive interviewing model (Rubin & Rubin, 2005) to find our results. In the first phase, we prepared the transcripts and refined and elaborated on the themes. In the second phase we coded the interviews to retrieve what the scholars said about the identified themes. Initially, we remained open to the possibility of follow-up interviews, but the questions were fairly simple and were addressed relatively well during the first interview, so additional interviews were not deemed necessary. This decision was also influenced by the fact that the respondents had very little time to devote to additional interviews.

Findings

Four respondents noted that their work frequently cited by Google Scholar was older work. This is not a surprise given that citations take a while to accrue in any field, even one interested in new technologies. Some respondents felt that their older work was still relevant, some felt that "the contents are outdated," while others saw the work as more tried and true ("It has withstood the test of time").

Five of the six respondents felt that scholars were the most likely citation source: "I am guessing that most of the citations are going to be from academic faculty and students of those faculty, just based on the nature of scholarship." One respondent felt that practitioners were more likely to have used and cited their work: "I think first that would probably be practitioners who are looking for ways that they can apply the principles or some standard directions." That scholars would presume that graduate students and other scholars are the most likely users of their work is not all that surprising as most scholars do realize that other scholars rather than practitioners are the primary consumers of their work. ("The content is perfectly relevant to practitioners, but they may not be as aware

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of the book.") Respondents recognized that fewer practitioners are writing for publication and therefore are not as likely to be the source of citations. This may indicate that our research is being consumed by more often by scholars than practitioners.

Approximately 80% of respondents felt good about their highly cited works ("I think the work is some of my better work"). When asked if they thought that their work was outdated or irrelevant since most of the articles or books were at least seven years old or older, most respondents indicated that even though their work had moved on in other, more interesting, directions, these highly cited articles, books, or chapters were good, solid work ("It's actually among one of my most favorite…I think it really helps to showcase what can happen when people are interested in doing the work and to give the tools to help them do that"). In general, contributions to a knowledge base take place within a gap in the literature, so it is not all that surprising that these works would be popular.

Many times the respondents saw their work as foundational, thus explaining the frequency of citations. Several respondents identified the nature of their work as either synthesis or a practitioner framework which they felt contributed to its popularity. "I think the reason that this article is popularly received is that it is a synthesis of some of the other literature and has good practical and pragmatic applications about the design principles." "I think it established the theoretical foundation for the work done in motivational research essentially."

What we were most interested in, however, was the author's reflections regarding their most cited work and the ways they felt it mirrored shifts in the field and the field's identity. Clearly, as this paper would indicate, we are, as a field, interested in definitions and identity. One respondent felt that this trend was away from hardware and software, but he was in the minority.

Well, I think that the field of instructional design technology spends a lot of time in foundational issues. We are concerned about definitions and basic models and frameworks that kind of define what we do. So as far as the identity of the field, we have moved from practical, we have moved from consideration of instructional strategies or instructional technologies hardware and software to broader concerns about the effective practices and about, you know, questions about how good instruction is designed.

Five of the six respondents felt that there is an enduring interest in high technology, from computers to web applications; respondents often felt that their articles or books were frequently cited because they were related to technology applications.

I think that one of the things that it says, you know, people are very interested in and continue to be interested in what is happening with the web. I think it was written out at that time when the field really began to shift more from traditional media to much more computer-based technologies and so I think it wasn't necessarily the cause of that, obviously, as a response to it, but I guess that was probably a point when a lot of people were getting in this field, and a lot of people outside the field were looking for ways to transition to these new technologies, and I think that is really where its contribution was probably greatest.

In those cases where technology was seen as an important trend in the writing, there was a tendency to also feel that the work was a "hot topic" rather than a classic, although in general the respondents felt that most of their highly cited works were classic. The respondents felt that this focus on technology and computer-based technology remains today and that the field is moving swiftly toward emerging technologies. This is an interesting perspective, given Wilson's (2005) commentary on the focus of our field on technologies.

Often, however, a snazzy new technology becomes the sole focus, not the ideas or innovative uses that lead to improved learning. After many hard lessons, we have learned this much wisdom in the field: uses of technology must be considered within the context of learning effectiveness; otherwise the technological innovation becomes a kind of fetish with near-magical powers on its own (¶2).

In terms of identity issues, this is perhaps the most telling, that we continue to cite most often those articles that contribute in either foundational ways or pragmatic ways to the promotion of specific technologies in education. For some this may seem an uninteresting finding. Certainly we are a field of IDT, therefore why would we NOT take as a central tenet of our identity the use of technologies? But what Wilson and others involved in this dialogue point out is that too narrow a focus on the technology itself leads to a lack of significant engagement with the learning theories and environment issues.

There was a feeling among respondents that the field continues to move toward constructivist, problem-based, and/or student-based learning environments.

If you look at the history of our field there was a huge paradigm shift somewhere in the '70s or '80s and it really wasn't from behaviorism, it was more from communication theory to constructivism. Technology had, prior to that time, been used exclusively to communicate ideas and all of the message design research of the '70s pretty much focused on how we design instruction and convey instructional messages with the assumption that the more effectively we communicate the more effectively people will learn.

One respondent felt that the impact of IDT scholarship is pretty limited to within our field. We cite rather widely across cognitive psychology, educational psychology and curricu-

lum as well as general education fields, but few of those fields read the work of instructional designers. There was also a sense among respondents that their frequently cited works might not have been their most scholarly or intellectually challenging pieces, but they had attained popularity, which is a different thing from intellectual acclaim. "I think I've written intellectually more significant works but I suppose it's because that sold a lot of copies that people cited it quite often. I'm not complaining."

Thus, respondents told us that we continue to focus on technologies, extend scholarship on constructivist/problem-based approaches, and tend to talk to ourselves.

Discussion and Conclusion

The purpose of this research was to investigate the ways in which the field of IDT can be seen through the lens of its most cited publications. It is believed that the field and its trends can be understood through an examination of these citations, and other citation analyses have taken on this task nicely (Kirby et al., 2005). However, we were interested in a relatively straightforward question: What do the *authors* of these works feel their publications say about the field in general? We found that authors felt their most cited works were a little outdated, but had stood the test of time, and that other scholars in the field (faculty and graduate students) were the most likely sources of citations—leading to a sense that we are talking to ourselves.

Authors felt that their work may have moved on, but that their highly cited works were good solid foundation links between fields or to areas of keen interest such as constructivism and new or emerging technologies. What does this tell us about our field broadly? While it is difficult to draw any sort of generalizable findings, and it was certainly not the purpose of this research to do so, it is interesting to find that many authors like their older work, recognizing a link to other relevant fields such as learning sciences, educational psychology and constructivism. The field continues to have an enduring interest in emerging technologies and from the list of highly cited works we find a balance between application of emerging technologies to real world instructional situations and theoretical work on topics of interest within emerging technologies. While this research represents a limited sample, and issue certainly can be taken with our choice of Google Scholar as our source for highly cited works, or our selection process for participants, there are some important findings here. Should the field of IDT be trying to reach more practitioners and scholars from other disciplines? Should we be focusing on emerging technologies and the expansion of constructivist learning? As Wilson (2005) asks, should we be narrowing or broadening the field in terms of inclusivity? It would certainly be interesting to reach the additional population, to focus specifically on international contexts, and to examine the trends associated with these citation patterns to determine the extent to which invisible col-

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Appendix: The Original List of Most Cited Works

The first number in parenthesis is the total citation count retrieved on November 3, 2005. The second number is citation count found on February 25, 2007.

1. **Sasha Barab (146/243)**
Barab, S. A., & Duffy, T. (2000). From practice fields to communities of practice. In D.H. Jonassen, & S. M. Land (Eds.), *Theoretical foundations of learning environments* (pp. 25-55). Mahwah, NJ: Lawrence Erlbaum Associates.

2. **Walter Dick (384/716)**
Dick, W., & Carey, L. M. (1996). *The systematic design of instruction*. New York, NY: Harper Collins College Publishers.

3. **Marcy Driscoll (231/ 430)**
Driscoll, M. P. (1994). *Psychology of learning for instruction.* Boston, MA: Allyn & Bacon Publishers.

4. **Michael Hannafin (69/102)**
Hannafin, M. J., & Peck, K. L. (1988). *The design, development, and evaluation of instructional software*. New York, NY: Macmillan.

5. **Janette Hill (73/115)**
Hill, J. R., & Hannafin. M. J. (1997). Cognitive strategies and learning from the World Wide Web. *Educational Technology Research & Development, 45*(4), 37-64.

6. **David Jonassen (294/479)**
Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999). *Learning with technology: A constructivist perspective*. Columbus, OH: Prentice Hall.

7. **John Keller (146/261)**
Keller, J. M. (1983). Motivational design of instruction. In C. M. Reigeluth (Ed.). *Instructional design theories and models: An overview of their current status.* Hillsdale, NJ: Erlbaum.

8. **Jeroen Van Merrienboer (108/331)**
Van Merrienboer, J. (1997). *Training Complex Cognitive Skill: A four-component instructional design model for technical training*. Englewood Cliff, NJ: Educational Technology Publications.

9. **David Merrill (133/205)**
Merrill, M. D. (1983). Component display theory. In C. Reigeluth (Ed.), *Instructional design theories and models: An overview of their current status*. Hillsdale, NJ: Erlbaum.

10. **Charles Reigeluth (93/190)**
Reigeluth, C. M. (Ed.). (1999). *Instructional design theories and models: An overview of their current status.* Hillsdale, NJ: Erlbaum.

11. **John Savery (316/568)**
Savery, J. R., & Duffy, T. M. (1995). Problem based learning: An instructional model and its constructivist framework. In B. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design.* Englewood Cliffs, NJ: Educational Technology Publications.

12. **David Wiley (221/402)**
Wiley, D. A. (2000). Connecting learning objects to instructional design theory: A definition, a metaphor, and a taxonomy. In D. A. Wiley (Ed.), *The instructional use of learning objects*. Retrieved November 3, 2005, from http://reusability.org/read/chapters/wiley.doc

13. **Brent Wilson (105/166)**
Wilson, B. G. (1996). *Constructivist learning environments: Case studies in instructional design.* Englewood Cliffs, NJ: Educational Technology Publications.

leges may exist (Crane, 1972). These are avenues for future exploration. In the meantime, we feel that this contribution of a slightly deeper understanding of interests in the field and the citations that follow those interests is an important consideration for future research and exploration of IDT identity.

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