

Teaching Research to
Instructional Design and Technology Students¹

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Abstract

This paper focuses on the research competencies of students in Instructional Design and Technology (IDT) programs. First, we describe how research is being taught to students enrolled in several leading IDT programs. Next, we present findings from a survey administered to determine what knowledge and skills are being taught to IDT graduate students. Implications for the design of courses that focus on research are discussed.

Introduction

The competencies of professionals in the Instructional Design and Technology (IDT) field have received increased attention in recent years. Several books, articles, and conference presentations have focused on the competencies of instructional designers (Richey, Fields, & Foxon, 2001), training managers (Foxon, Richey, Roberts, & Spannaus, 2003), instructors in face-to-face and online settings (Goodyear, et. al. 2001; Klein, Spector, Grabowski, & de la Teja, 2004; Spector & de la Teja, 2001), and performance technologists (Fox & Klein, 2003).

However, very little work has been done on the research competencies of students who graduate from our IDT programs. This is in spite of a trend in our field toward the use of alternative research methods to address questions about learning and instruction. For example, an examination of dissertations (Caffarella, 1999), conference papers (Al-Saleh, 2000), and journal articles (Ross & Morrison, 2003) in the IDT field suggest that the use of qualitative research methods has increased in the past decade while the use of experimental methods has decreased. Furthermore, recent special issues of *Educational Technology* (Volume 45, Number 1, 2005), the *Journal of the Learning Sciences* (Volume 13, Number 1, 2004), and *Educational Researcher* (Volume 32, Number 1, 2003) have focused on design-based research, a method that emphasizes

the study of learning as a result of designing unique educational interventions (Dede, 2005; The Design-Based Research Collective, 2003; Reeves, 2005). In addition, research methods used to study the design and development of instructional programs, tools, and models have been described and implemented more frequently in recent years (Richey, Klein & Nelson, 2003; van den Akker, et al 1999).

IDT faculty who prepare their students to be competent researchers should be responsive to the ever changing nature of research in our field. The current study examines the research skills and knowledge IDT graduate students acquire and how they attain them. The study continues a line of research conducted to identify the knowledge and skills that students in IDT programs should obtain. Earlier studies have examined the optimal content and delivery method for a “foundations” course in Educational Technology (Klein, Brinkerhoff, & Koroghlanian, 2003) and have focused on the skills that IDT students should learn in the area of performance improvement (Klein & Fox, 2003). The purpose of the current work was to answer the following two questions:

- How is research being taught to IDT graduate students?
- What research methods, processes, and issues are being taught to IDT graduate students?

Phase 1

During this phase of the study, we obtained and analyzed the syllabi from research courses offered at several leading IDT programs to determine how research is being taught to graduate students in the field.

Participants

Our sample consisted of twelve IDT programs listed in the 2002 *Educational Media and Technology Yearbook (EMTY)*. We only sampled programs that EMTY listed as offering a Ph.D.

degree in Instructional Technology or Instructional Design and Development. The following institutions were included in our initial sample - Arizona State University, Brigham Young University, Florida State University, Indiana University, Pennsylvania State University, Purdue University, Syracuse University, University of Georgia, University of Memphis, University of Northern Colorado, Utah State University, and Wayne State University.

Procedures

We conducted a web search of each IDT program at the institutions listed above to determine their research course offerings. Next, we obtained the syllabi for research courses offered by each program. Some of the course syllabi were found on the web, while others were obtained by making direct contact with individual faculty members at each program. Syllabi for research courses offered at 10 or the 12 universities were obtained and include in our analysis.

We then conducted a content analysis of the research course syllabi. Each syllabus was examined for the following: course title, credit hours, objectives, textbooks and other readings used, topics covered, instructional activities, projects, and assignments.

Findings

Several trends were identified by the content analysis. These trends are reported below.

- Most of the IDT programs in the sample offer their own research courses. Several programs offer more than one research course. A few programs rely on others in their college to offer these courses.
- Most of the courses examined focus on doing research. Many included requirements such as planning and conducting a research study. Some related to planning a dissertation study. Others focused on specific phases such as forming a research problem and conducting a literature search.

- A range of quantitative and qualitative methodologies is taught in IDT research courses.
- A wide variety of textbooks are used in IDT research courses. While several textbooks on research methodology have been adopted, preliminary analyses did not suggest any book as being most widely used. Several courses have students read excerpts from different textbooks.
- A few courses require students to read, interpret, and analyze primary source documents such as published research articles.

Phase 2

During this phase of the study, we developed and administered an online survey to determine what research methods, processes, and issues are taught to IDT graduate students.

Participants

We sent a request for participation to two division listservs owned by the Association of Educational Communications and Technology (Design & Development Division and Research & Theory Division) and to a listserv owned by the Professors of Instructional Design and Technology (PIDT). In addition, a request was sent to consulting editors of *Educational Technology Research and Development* and to a sample of individuals listed on the website, *Who's Who in Instructional Design and Technology*.

Our request led to 50 graduate students and 50 faculty members who completed the survey (N = 100). Respondents represented over 35 IDT programs mostly located in the United States. Three programs were located outside the U.S. (Australia, China, and the Middle East). However, not all respondents listed their program affiliation when given the option.

Survey Instrument

The first section of the survey provided a list of 15 different research methods (see Table 1) and asked respondents to rate the degree to which students learn about each method using the following scale:

0 = This research method is not covered in our curriculum.

1 = Students are expected to acquire knowledge related to this method.

2 = Students are expected to acquire skills related to this method.

3 = Students are expected to acquire both knowledge & skills related to this method.

The second section of the survey examined the degree to which students receive formal instruction on how to conduct a research study (see Table 2). Respondents used the following scale to rate ten research processes:

0 = Students are not taught how to do this research process.

1 = Students are taught how to do this process but never required to do it.

2 = Students are taught how to do this process and do it for the first time during their thesis or dissertation.

3 = Students are taught this process and do it before conducting their thesis or dissertation.

The third section of the survey focused on five issues related to conducting research (see Table 3) and asked respondents to rate the degree to which students acquire knowledge and skills related to each issue using the same scale presented in section one.

The fourth section of the survey asked respondents to identify whether they were a student or a faculty member. Faculty were asked if they taught graduate-level research courses

and if they supervised research theses and/or dissertations. An optional item asked respondents to provide the name of their university and program.

Findings

Table 1 provides the rankings and mean scores for the 15 research methods included in the survey. These data show that five research methods (evaluation, qualitative, survey, experimental, & design/development research) received an overall rating between 2.06 - 2.32 indicating that most IDT students are expected to acquire skills related to these methods. Four other research methods (quasi-experimental, case study, mixed-methods, and descriptive research) received an overall rating of 1.76 - 1.94 suggesting that students in many programs are expected to obtain skills related to these methods.

The research method data were analyzed to determine if any differences existed between students and faculty members. A significant difference was found for quasi-experimental methods [$F(1, 98) = 7.86, p < .01$] and action research [$F(1, 98) = 14.29, p < .001$]. In both cases, faculty members rated these methods higher than students.

Table 2 shows that nine of the ten research processes included in the survey received an overall rating between 2.58 - 2.83 indicating that most IDT students are taught these processes and do them before conducting their thesis or dissertation. A significant difference was found for analyzing & interpreting research data [$F(1, 98) = 7.76, p < .01$], writing research reports [$F(1, 98) = 10.56, p < .01$], sampling participants [$F(1, 98) = 8.46, p < .01$], and developing data collection instruments [$F(1, 98) = 12.31, p < .001$]. In all cases, faculty members rated these research processes higher than students.

Table 3 provides the rankings and mean scores for the five research issues included in the survey. These data reveal that two issues (electronic searches & databases and analyzing research

studies) received an overall rating of 2.43 and 2.36 respectively indicating that most IDT students are expected to acquire skills related to these issues. The three other issues (ethics, trends in IDT research, and professional contexts for research) received an overall rating above 1.50 suggesting that IDT students acquire some knowledge about these topics.

Discussion

The purpose of this study was to investigate the research competencies of graduate students in IDT programs by examining the skills and knowledge students acquire and how they attain them. The study was conducted in two phases. In Phase 1, we examined the syllabi from research courses offered at several leading IDT programs to determine how research is being taught to graduate students in the field. In Phase 2, we conducted an online survey to determine what research methods, processes, and issues are taught to IDT graduate students.

Results from both phases of the study revealed that a range of quantitative and qualitative methodologies is being taught to students enrolled in IDT research courses. An interesting finding to emerge was that IDT faculty and students rated evaluation, qualitative, and survey methods somewhat higher than experimental and quasi-experimental methods. This finding can be explained by the applied nature of our field. It is likely that evaluation, qualitative, and survey data collection techniques are covered in multiple courses when students are learning about needs assessment, working with subject matter experts, or conducting formative and summative evaluation of intervention. Experimental methods are likely only taught in courses focused specifically on research.

The finding that qualitative research methods were rated somewhat higher than experimental methods is interesting in light of recent trends in the literature. Several authors have reported that the use of experiments has recently declined while the of qualitative research

methods is on the rise (Al-Saleh, 2000; Cafferalla, 1999; Ross & Morrison, 2003). These findings should be interpreted with some caution, especially in light of Winn's (2003) recent admonishment that "educational researchers must not reject experimental research, neither must they reject useful research methods that were added to their toolkit in the last two decades" (p. 369).

It is also interesting that that design and development research was rated so high. This suggests that developmental research (Richey, Klein & Nelson, 2003; van den Akker, et al 1999) and design-based research (Dede, 2005; The Design-Based Research Collective, 2003) are being taught to IDT students. Individuals who conduct this type of research should be encouraged that journals and magazines are increasing the publication of articles using these methods (for example, see the special issue on design-based research in *Educational Technology*, Volume 45, Number 1, 2005).

Turning to research processes, we found most IDT students are taught the typical steps for how to conduct a research study and are required to do them before carrying out their thesis or dissertation. However, we did not find that any one particular textbook as being most widely used to teach students about these research processes. An interesting find to emerge was that students who responded to our survey indicated a lower agreement than faculty for four of the ten research processes - analyzing & interpreting research data, writing research reports, sampling participants, and developing data collection instruments. These differences suggests that IDT faculty who teach research courses should examine their objectives and activities to be sure these steps in the research process areas are being covered in enough detail.

During Phase 1 of the study, we were surprised to find that only few courses require students to read, interpret, and analyze primary source documents such as published research

articles. However, the results from Phase 2 suggested that most IDT students are expected to acquire skills related analyzing research studies. Regardless, our experience suggests that requiring students to read, interpret, and analyze published research articles is a robust instructional outcome and activity.

We also think that students should learn about the professional contexts of research in the IDT field. However, our results suggest that this issue may not be covered in much depth. IDT is an empirical field; students who graduate from our programs should be able to apply research skills to a variety of contexts including business, industry, military, and school-based settings.

Too often, research is thought of as the responsibility of academics that are required to do it to get tenure and promoted. Faculty who offer degrees in IDT should work to ensure that their graduates have competencies to be successful researchers. They should also push students to apply these competencies regardless of the setting in which they choose to work.

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Table 1

Rankings & Means for Research Methods

Ranking	Research Method	Faculty	Students	Total
1	Evaluation	2.54	2.10	2.32
2	Qualitative	2.34	1.96	2.15
3	Survey research	2.26	2.02	2.14
4	Experimental	2.18	1.98	2.08
5	Design/Development research	2.10	2.02	2.06
6	Quasi-experimental*	2.22	1.66	1.94
7	Case study	2.04	1.58	1.81
8	Mixed-methods research	1.88	1.72	1.80
9	Descriptive research	2.00	1.52	1.76
10	Action research*	1.72	.92	1.32
11	Ethnography	1.32	1.08	1.20
12	Meta-analysis	1.18	1.10	1.14
13	Narrative research	.88	.92	.90
14	Historical research	.66	1.02	.84
15	Philosophical inquiry	.64	.74	.69

* A significant difference was found between faculty and students ($p < .01$).

Table 2

Rankings & Means for Research Processes

Ranking	Research Processes	Faculty	Students	Total
1	Specifying research questions	2.94	2.72	2.83
2	Conducting a literature review	2.94	2.68	2.81
3	Selecting a research topic	2.86	2.74	2.80
4	Identifying research variables	2.90	2.64	2.77
5	Constructing research hypothesis	2.80	2.66	2.73
6	Analyzing & interpreting research data*	2.90	2.54	2.72
7	Writing research reports*	2.90	2.46	2.68
8	Selecting a research design	2.76	2.52	2.64
9	Sampling participants*	2.78	2.38	2.58
10	Developing data collection instruments*	2.74	2.14	2.44

* A significant difference was found between faculty and students ($p < .01$).

Table 3

Rankings & Means for Research Issues

Ranking	Research Issue	Faculty	Students	Total
1	Electronic searches and databases	2.46	2.40	2.43
2	Analyzing research studies	2.60	2.12	2.36
3	Ethics	1.74	1.78	1.76
4	Trends in IDT research	1.78	1.64	1.71
5	Professional contexts of research	1.50	1.56	1.53