

The Foundations of Educational Technology: A Needs Assessment

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Results of a needs assessment suggest optimal instructional content and delivery strategies for a “foundations” course and reveal respondents’ feelings about using the Internet for delivery.

Many graduate programs in educational technology offer an introductory course aimed at providing students with knowledge about our field. Typically, this course provides entry-level master’s and doctoral students with their first exposure to both historical and recent developments in the field (Pershing, Molenda, Paulus, Lee, & Hixon, 2000; Reiser et al., 1999).

The educational technology program at Arizona State University (ASU) has offered a course called “Foundations of Educational Technology” since 1970. Our course has evolved over the past 30 years from a survey of the product development cycle to an examination of the accomplishments and issues in the field.

Recently, we conducted a needs assessment to determine the optimal instructional content and delivery method for the course. The needs assessment also examined feelings about using the Internet to deliver the course.

The needs assessment was prompted in part by the results of a focus group comprising students, graduates, and faculty of our educational technology program and employers who hire our graduates. The focus group indicated

that “knowledge about the field” and “technical literacy” were among the essential skills and knowledge a student should possess upon graduation from our program. Another impetus for our needs assessment was the recent merger of the Educational Technology program and the Educational Media and Computers program at ASU and the desire to combine two courses about the field into one course.

The purpose of our needs assessment was to answer the following questions:

- What is the optimal instructional content for a foundations course in educational technology?
- What is the optimal delivery method for a foundations course in educational technology?
- What feelings do respondents have about the use of the Internet for a foundations course in educational technology?

METHOD

Methods and techniques for our needs assessment followed suggestions provided by Allison Rossett in her 1987 book, *Training Needs Assessment*.

Data Sources—We used sources of data, including extant data, current stu-

dents, graduates of our program, and faculty from programs in educational technology and instructional design and technology.

We collected extant data to identify the content and topics most frequently covered in “foundations” or introductory survey courses in educational technology. These data were obtained by examining syllabi for graduate-level courses taught at the following institutions: Arizona State University, Florida State University, University of Georgia, Indiana University, San Diego State University, and Syracuse University.

We contacted 35 students enrolled in our educational technology program about participating in the needs assessment. Twenty-three students responded to the request, a response rate of nearly 66%. The majority of these participants were female (74%), between 23 and 30 years old (52%), and were enrolled in the master’s degree program (87%) in educational technology at ASU. Most rated their level of computer skill as either intermediate (48%) or advanced (39%). Nine current students indicated previous experience with courses delivered via the Internet.

We also contacted 10 graduates of our program about participating in the needs assessment. Eight of the 10 graduates responded to the request (an 80% response rate). The majority were fe-

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male (75%), over 31 years old (88%), and held a master's degree in educational technology (88%). Participants rated their level of computer skill as intermediate (50%) or advanced (50%). Three graduates indicated previous experience with courses delivered via the Internet.

We contacted 10 individuals with faculty positions at programs in educational technology—or instructional design and technology—throughout the United States to request their participation in the needs assessment. Nine out of 10 faculty responded to the request, a 90% response rate. The majority of these faculty were male (78%) and over 41 years old (88%). Six faculty indicated that they had previously taught a course on the foundations of educational technology, and three faculty indicated experience teaching courses delivered via the Internet.

INSTRUMENT

Each respondent group (students, graduates, faculty) completed a survey developed to address issues related to content, delivery method, and use of the Internet for a foundations course in educational technology. The survey was designed to collect specific information from each respondent group. Items related to content were written based on a document analysis of the book *Instructional Technology: Past, Present and Future* by Gary Anglin (1995). We developed an initial content topic list using the section headings from this book. Next, the list was expanded to include other topics that appeared in at least two of the course

syllabi that we had collected. Respondents were asked to identify the topics that should be included in a foundations course from a list of 18 possible topics. Survey items related to delivery offered a list of five possible methods and asked respondents to indicate the optimal delivery method for a foundations course. Items related to feelings about use of the Internet asked respondents to indicate whether required

use of this medium would encourage or discourage faculty-student interaction and help or hinder learning. We also collected data on participants' demographics and experience with Internet and related technology.

RESULTS

Optimal content

A major purpose of our needs assessment was to identify the optimal instructional content for a foundations course in educational technology. We examined the syllabi from the six graduate programs listed above to identify the topics most frequently covered in these courses (see Table 1). We found that (a) topics related to the definitions of educational technology and instructional design models were included in all six of the courses; (b) topics related to the history of educational technology and professional competencies and issues were included in five of the courses; (c) topics on evaluation, instructional theory, learning theory, and trends in educational technology were covered in four of the courses; (d) topics related to innovation and change, needs assessment, and performance technology were included in three courses; (e) topics about adoption and diffusion, distance education, Gagne's events of instruction, instructional message design, and media research were covered in two of the courses.

We also asked graduates and faculty to identify the optimal topics that should be included in a course in foundations of educational technology (see Table 2). Eight graduates and seven

faculty responded to items on optimal topics. Topics selected by approximately half or more graduates and faculty include the following: definitions of educational technology (100%), instructional design models (93%), trends in educational technology (93%), history of educational technology (80%), needs assessment (73%), instructional theory (53%), professional competencies and issues (53%), adoption and diffusion (47%), and evaluation (47%).

We also examined the data on optimal course topics separately for graduates and faculty. Topics identified by half or more graduates, but not by half or more faculty, were instructional theory (63%), professional competencies and issues (63%), distance education

Table 1.
Topics covered by two or more courses.

Topic	Frequency
Definitions of Educational Technology	6
Instructional Design Models	6
History of Educational Technology	5
Professional Competencies & Issues	5
Evaluation	4
Instructional Theory	4
Learning Theory	4
Trends in Educational Technology	4
Innovation & Change	3
Needs Assessment	3
Performance Technology	3
Adoption & Diffusion	2
Distance Education	2
Gagne's Events of Instruction	2
Instructional Media Design	2
Media Research	2

(50%), Gagne's events of instruction (50%), and media selection (50%). Topics identified by half or more faculty, but not by half or more graduates, were adoption and diffusion (57%), evaluation (57%), learning theory (57%) and media research (57%).

It is interesting to note that two faculty declined to respond to the items regarding optimal course content: one questioned whether the foundations of educational technology should be taught as a distinct course; the other indicated that topics could not be identified without knowledge of the objectives of the course.

Optimal delivery methods

Another purpose of our needs assessment was to identify the optimal delivery methods for an educational technology foundations course. Respondents were asked to indicate the optimal delivery method from a list of five possible methods (see Table 3).

Twenty-one students responded to the items on optimal delivery method. Seven students (33%) indicated that the course should be delivered using entirely face-to-face classroom activities. Six students (28%) responded that face-to-face classroom activities with online readings and assignments would be the optimal delivery method. Four students (20%) indicated that the course should be delivered using half online activities and half face-to-face classroom activities. Four others (20%) responded that a course emphasizing online instruction with classroom meetings would be optimal. None of the students indicated that the course should be delivered entirely online.

Eight graduates answered the items concerning optimal delivery method. Five graduates (63%) indicated that face-to-face classroom activities with online readings and assignments would be an optimal delivery method. One graduate indicated that the course should be taught using half online activities and half face-to-face classroom activities, while another stated a preference for an emphasis on online instruction with classroom meetings. In

Table 2. Optimal course topics identified by graduates and faculty.

Course Topic	Graduates	Faculty	Total
Definitions of EDT	8 (100%)	7 (100%)	15 (100%)
Instructional Design Methods	8 (100%)	6 (86%)	14 (93%)
Trends in EDT	7 (88%)	7 (100%)	14 (93%)
History of EDT	6 (75%)	6 (86%)	12 (80%)
Needs Assessment	6 (75%)	5 (71%)	11 (73%)
Instructional Theory	5 (63%)	3 (43%)	8 (53%)
Professional Competencies	5 (63%)	3 (43%)	8 (53%)
Adoption & Diffusion	3 (38%)	4 (57%)	7 (47%)
Evaluation	3 (38%)	4 (57%)	7 (47%)
Learning Theory	2 (25%)	4 (57%)	6 (40%)
Media Research	2 (25%)	4 (57%)	6 (40%)
Distance Education	4 (50%)	2 (28%)	6 (40%)
Gagne's Events of Instruction	4 (50%)	2 (28%)	6 (40%)
Media Selection	4 (50%)	1 (14%)	5 (33%)

Table 3. Optimal delivery methods identified by students, graduates, and faculty.

Course Delivery Method	Students	Graduates	Faculty	Total
Entirely face-to-face classroom activities	7 (33%)	0 (0%)	2 (28%)	9 (25%)
Emphasize face-to-face classroom activities with online readings and assignments	6 (28%)	5 (63%)	3 (43%)	14 (38%)
Half online activities and half classroom activities	4 (20%)	1 (12%)	1 (14%)	6 (16%)
Emphasize online activities with classroom meetings	4 (20%)	1 (12%)	0 (0%)	5 (14%)
Entirely online (class never meets face-to-face)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	1 (12%)	1 (14%)	2 (5%)

addition, one other graduate responded that one-third of the course should be online. None of the graduates indicated that the course should be delivered entirely online.

Seven faculty answered the items on optimal course delivery method. Three faculty (43%) responded that face-to-face classroom activities with online readings and assignments would be the

optimal delivery method. Two others (28%) indicated that the course should be delivered using entirely face-to-face classroom activities. Another faculty member indicated that the course should be taught using half online activities and half face-to-face classroom activities. The other faculty respondent included a statement that the class should be Web-supported, but the level

to which the class should be online depended on the goals of the course. None of the faculty indicated that the course should be delivered entirely online.

FEELINGS ABOUT USE OF THE INTERNET

The final purpose of our needs assessment was to determine how students, graduates, and faculty felt about using the Internet for a foundations course in educational technology. Items related to feelings about use of the Internet asked respondents to indicate whether required use of this medium would encourage or discourage faculty-student interaction and help or hinder learning (see Table 4).

Twenty-three students completed the items concerning feelings about required use of the Internet for the course. Results revealed that (a) 14 students (61%) indicated that the Internet would discourage faculty-student contact; (b) 13 students (57%) responded that Internet use would discourage student-student contact; (c) 11 students (48%) felt that the Internet would prevent some students from succeeding in the course, and (d) six students (26%) felt that Internet use would create a hardship for some students and put an unfair emphasis on computer literacy instead of course content. However, 11 students (48%) thought that required use of the Internet for the course would help them stay current with technology, and six students (26%) felt Internet use would prepare them for the job market.

Eight graduates completed the items concerning feelings about required use of the Internet for the course. Seven graduates (88%) indicated that Internet use would help students stay current with technology and five graduates (63%) felt that such a requirement would prepare students for the job market. However, four graduates (50%) thought it would prevent some students from succeeding in the course and three graduates (38%) indicated that required Internet use would discourage faculty-student and student-student contact.

Seven faculty responded to the items concerning feelings about required Internet use. Five faculty (71%) indicated that it would help students stay current with technology and prepare them for the job market. However, four faculty (57%) indicated that required Internet use would discourage faculty-student and student-student contact.

IMPLICATIONS

The results of our needs assessment are currently being used to revise the foundations course at Arizona State University. For example, while 93% of respondents to our survey indicated that trends in educational technology should be covered in a foundations course, our course has not focused much on recent trends in the field. The course has traditionally included topics such as definitions and history of the field, instructional design models, and needs assessment. We have revised the

course to give students an opportunity to learn more about contemporary issues such as performance technology and constructivism (Reiser & Ely, 1997). In fact, we have renamed the course—from “Foundations of Educational Technology” to “Foundations and Issues in Educational Technology” to reflect an increased focus on trends in the field.

We have also revised the course to include some online delivery of course materials. Our needs assessment revealed that a majority of students, graduates, and faculty who responded to our survey favored some form of online delivery for the course. However, a majority also indicated that requiring students to use the Internet for the course would discourage faculty-student and student-student contact and would prevent some students from succeeding in the course. Based on the results of this needs assessment, we continue to emphasize face-to-face classroom

Table 4. Participant feelings toward use of the Internet.

	Students	Graduates	Faculty	Total
IN YOUR OPINION, REQUIRED USE OF THE INTERNET FOR THE COURSE WOULD:				
help students stay current with technology	11 (48%)	7 (88%)	5 (71%)	23 (25%)
prepare students for the job market	6 (26%)	5 (63%)	5 (71%)	16 (42%)
encourage faculty-student contact	4 (17%)	2 (25%)	2 (28%)	8 (21%)
encourage student-student contact	4 (17%)	2 (25%)	1 (14%)	7 (18%)
discourage faculty-student contact	14 (61%)	3 (38%)	4 (57%)	21 (55%)
discourage student-student contact	13 (57%)	3 (38%)	4 (57%)	20 (53%)
prevent some students from succeeding in the course	11 (48%)	4 (50%)	3 (43%)	18 (47%)
create a hardship for students	6 (26%)	3 (38%)	3 (43%)	12 (32%)
put an unfair emphasis on computer literacy	6 (26%)	2 (25%)	0 (0%)	8 (21%)
be inappropriate for this course content	0 (0%)	1 (13%)	2 (28%)	3 (8%)

instruction, and students now have on-line access to course objectives, assignments, and readings.

We believe that this needs assessment provides some implications for others who teach an introductory course aimed at providing students with knowledge about the field of educational technology. Our study indicates some optimal instructional content and delivery strategies for a "foundations" course; it also suggests some feelings about the use of the Internet for such a course. Readers should note that we sampled a small number of students and graduates of our educational technology program and a small number of faculty from other programs. We encourage others to collect data to determine the optimal instructional content and delivery method for their

own courses on the foundations of educational technology.

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