

# Graduate Education in Instructional Systems: A Review of Selected Programs



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Over the past decade there has been increasing interest in the study of variables and conditions directly related to the design and evaluation of learning environments. The areas and effects of investigation by educational researchers are well documented in the literature reviews: educational media (Lumsdaine and May, 1965; Saloman and Clark, 1977), content analysis (Frase, 1975), design strategies (Klausmeier, 1976; Merrill and Boutwell, 1973), evaluation (Wittrock and Lumsdaine, 1977), and management (Glaser and Resnick, 1972). Concurrent with this research trend has been the growing professionalism of instructional development in higher education, industrial training, health sciences, and governmental agencies. As a result of both academic interest in and societal needs for instructional development (a general term used here to include such activities as management, design, and evaluation), it was inevitable that university graduate programs would expand their course offerings and create new specialties or entirely new academic programs focusing in varying ways on some or all aspects of instructional development.

The purpose of this report is to describe and contrast selected graduate programs so that patterns and directions of this emerging field can be examined

by the community of educational researchers. This study reviews the programs of a few major institutions in an attempt to define general characteristics among, as well as differences between, programs. It does not intend to standardize graduate programs according to the structures of those surveyed but rather to have the report function as a basis for common discussion from which alternatives can be suggested. Previous survey efforts have concentrated primarily on individuals involved in educational media related functions (e.g., Chisholm and Ely, 1976; Milkman, 1970; Wallington, et al., 1971). Surveys have focused on the service role of media personnel while largely ignoring the functions of instructional and curriculum development, evaluation, and research. An exception to this general line of job analysis was the study by Hoban (1974), which investigated the characteristics of instructional developers. A finding that relates to graduate programs in instructional systems was that over 70 percent of the respondents had earned, or expected to earn, doctorate degrees and that at least 93 percent of the respondents had worked or were working on graduate degrees in education.

Given the positive data on job opportunities in instructional systems (Peterson, 1977), as well as the large number of personnel now engaged in or anticipating advanced academic work, it is important to examine graduate programs that provide the defining characteristics of that education.

The graduate programs reviewed offer advanced study in all areas of instructional systems but differ in size (i.e., number of students and faculty), age of program, courses offered within the program, graduate degrees and certificates offered, faculty preparation, and program philosophy as represented in goals and professional competencies. While not inclusive of all activities representing instructional systems, the

graduate programs surveyed represent the range of established programs. The schools included in this survey were Arizona State University, Brigham Young University, Florida State University, Indiana University, Ohio State University, Pennsylvania State University, Syracuse University, University of Iowa, and University of Minnesota.<sup>1</sup>

## Method

To gather the data necessary to review the programs, we constructed a ten-page questionnaire consisting of seven sections. The questionnaire asked about program characteristics, including official title, degrees offered, degrees granted, and courses offered or under development (section 1); faculty characteristics, including the level of faculty appointment and faculty preparation (section 2); student characteristics (section 3); goals of master's degree programs, doctoral degree programs, and anticipated goal changes foreseen within the next 5 years (section 4); placement of program graduates on the basis of a ranking of employment categories (section 5); a summated rating scale asking programs to rate competency statements in the order of emphasis they receive in the master's and doctoral degree programs (section 6); and a ranking of the same competency statements in the order of importance they would receive in an ideal instructional systems graduate program (section 7).

The questionnaire was mailed to a specific individual in each institution surveyed. When all of the questionnaires were returned, summary tables of the reported information were prepared and mailed back to the respondents, with their original questionnaire, in order to ensure the accuracy of the reported data.

<sup>1</sup>Data were collected during the period January-April 1977.

## Program Characteristics

### Names

Program labels indicate the diversity of graduate study in instructional systems. Five program names that make direct reference to *technology* are Arizona State University (Educational Technology), Brigham Young University (Instructional Science and Technology), Indiana University (Instructional Systems Technology), University of Iowa (Instructional Design and Technology), and Syracuse University (Instructional Technology). Others refer to the broader area of media: Pennsylvania State University, (Instructional Media) and Ohio State University (Educational Communications). The University of Minnesota and Florida State University have limited their program titles to the process itself: Instructional Systems and Instructional Design and Development, respectively.

With the recent growth in instructional systems, it is not surprising that the descriptive labels for the graduate programs exhibit diversity. The labels selected may indicate important differences which demonstrate the scope of activities in learning-environment development, management, and evaluation. As the data show, programs which include the label *technology* tend to emphasize that component of instructional systems more than programs without it. In some instances, a program without the *technology* label (University of Minnesota) reported more course work in that area than a program (Syracuse University) that mentioned *technology* in its title.

### Program Age

Determining the age of a program is difficult because many programs have evolved over a long period and have undergone various name changes. The programs at Syracuse University and Ohio State University both report that they are over 20 years old, and Indiana University's program has been in existence for 36 years. Arizona State University's Educational Technology program was the only one of those surveyed that was conceived as a new program. Most have resulted from the consolidation of programs within the areas of educational psychology and audiovisual education.

### Student Number

Though the number of students in a particular program is approximate (the

distinction between part- and full-time students makes it difficult to derive accurate figures), the numbers presented by the respondents do show fairly robust graduate programs. Instructional systems programs surveyed range in student enrollment from 40 at Arizona State University to 365 at Pennsylvania State University (Table 1). These figures include students from media certification programs as well as those from graduate programs. Brigham Young University, Indiana University, Pennsylvania State University and Syracuse University reported more full-time than part-time students.

### Age and Sex of Students

With a majority of the students in all programs under 35 years of age, the typical program in this survey has a young student body. The youngest group is found in the Instructional Systems program at the University of Minnesota, where 28 of the 32 master's students are between the ages of 22 and 28 and only 5 of the 13 doctoral students are over 30. Of the programs surveyed, women comprise about one half of the master's students but only one third of those pursuing doctorates. The University of Minnesota was the only school indicating more women than men in both master's and doctoral programs.

### Degrees and Certificates

One indication of the scope of an academic program is the number and type of degrees and certificates offered. The programs surveyed all offer Doctor of Philosophy degrees, with Brigham Young University, Indiana University, and Syracuse University offering additional EdD degrees (see Table 1). The distinction between the MA and MS degrees appears to be one of institutional designation rather than substance in the actual programs of study; only Brigham Young University offers both. A specialist program, usually a certificate indicating directed graduate work after the master's, is offered at Brigham Young University, Indiana University, and the University of Iowa. State media certification programs for public school personnel in audiovisual and/or related functions do not seem to be a major component of the surveyed programs.

The number of degrees granted appears to be directly related to the age of the program. For example, the number of students seeking master's degrees at Brigham Young University is approximately the same as Syracuse,

while Syracuse, with the highest number of degrees granted, has graduated about three times as many students. However, Brigham Young University's Instructional Science and Technology program has been active since 1970 while Syracuse University's Instructional Technology program has existed for 20 years. While listing few or no graduates, the universities of Iowa, Minnesota, Ohio State, and Pennsylvania State were reporting numbers according to current program structures. The number of graduates reported does not reflect the actual number graduated by previously existing programs in those schools.

## Faculty Characteristics

### Number of Faculty

The program with the largest number of faculty members is Florida State's Instructional Design and Development program with 9 faculty members at 100 percent appointment, 2 at 50 percent appointment, 10 at 25 percent appointment, and 1 at 15 percent appointment for a total of 18 faculty members. On the other end of the continuum was the new program at Arizona State, with 5 faculty members at varying percentages of appointment.

### Faculty Preparation and Assignment

Of major concern in any assessment of a graduate studies program is the type of faculty preparation, and this is rather wide in the programs surveyed (Table 2). However, this form of conventional program assessment is not necessarily valid in the case of instructional systems graduate studies programs because the area is new. In most programs, the teaching assignments seem to be filled by faculty having preparation in the appropriate content area. In certain situations, faculty have training in a given content area yet have no teaching assignments related to that preparation.

Three content areas distinguish faculty preparation: instructional development (total = 39), instructional psychology (total = 32), and visual technology (total = 29). Faculty preparation in the use of visuals is almost three times greater than faculty preparation in other media (i.e., video, audio, and computer). This is most likely due both to the age of the medium and the variety of visual technologies. The combined totals of instructional development and instructional psychology

**TABLE 1**  
**Graduate Degrees Offered, Number of Enrolled Students and Number of Graduated Students**

Institution	Graduate Degrees/Certificates											
	Media Certificate		Master of Arts		Master of Science		Doctor of Philosophy		Doctor of Education		Specialist in Education	
	Part	Full	Part	Full	Part	Full	Part	Full	Part	Full	Part	Full
Arizona State U. Enrolled				25				10				
Graduated				5				5				
Brigham Young U. Enrolled												
Graduated	30	55	0	9	20	30	7	29	0	5	0	1
Florida State U. Enrolled		100		10		100		10		0		40
Graduated					0	24		18				
Indiana U. Enrolled								42				
Graduated					0	150		20		65		45
Ohio State U. Enrolled				70						300		161
Graduated				12				17				
Pennsylvania State U. Enrolled												
Graduated	300	0	8	35			7	15				
Syracuse U. Enrolled				*				*				
Graduated	5	0			20	40	35	38	0	10		
U. of Iowa Enrolled						300		250		150		
Graduated				28	10			17	10		7	0
U. of Minnesota Enrolled	85	11	10	32								0
Graduated		54		12			5	13				1

\*Information Not Available

**TABLE 2**  
**Faculty Teaching Assignments and Academic Preparation**

Institution	Content Areas								
	Instructional Development	Instructional Psychology	Measurement and Evaluation	Management	Library Science	Video	Visual	Audio	Computer
Arizona State U. Assignment	2	2	1						
Preparation	3	2	1	1	3	1	2	1	1
Brigham Young U. Assignment	5	4	3						
Preparation	11	9	5	3	1	1	2	2	3
Florida State U. Assignment	18	4	3	5	0	2	4		1
Preparation	5	1	0	1	1	2	5	2	1
Indiana U. Assignment	3	4	0	3	1	1	5		1
Preparation	3	6	1	5	1	1	7		1
Ohio State U. Assignment	2	0	0	2	1	1	3	0	0
Preparation	3	1	1	2	1	2	4	1	1
Pennsylvania State U. Assignment	3	2	2	1					
Preparation	3	2	2	1			1		
Syracuse U. Assignment	4	3	4	2	1		1		2
Preparation	4	3	4	3	2		3		2
U. of Iowa Assignment	3	2	1	2	1	1	2	1	1
Preparation	2	2	2	2	1	1	2	1	1
U. of Minnesota Assignment	6	7	1	1				2	5
Preparation	5	6	1	1			1	2	3

**TABLE 3**  
**Number of Courses Offered in the Program and Number Required Outside the Program**

	Content Area										
	Instructional Development (Curriculum)	Instructional Psychology (Theory)	Measurement and Evaluation	Management	Library Science	Video	Visual	Audio	Computer	Research and Statistics	Internship/Seminar
Arizona State U. In	6	2	3	1	3	2	3				
Outside	2	2	1	0	0	0	0			2	2
Brigham Young U. In	6	5	6	4	0	3	4	1	2	2	0
Outside	0	6	1	0	3	2	5	0	1	0	1
Florida State U. In	16	4	1	2		1	8		3	3	0
Outside	0	1	0	0		0	0		0	4	0
Indiana U. In	7	2	0	6		3	10		1	6	
Outside	2	2	2	0		0	0		0	2	
Ohio State U. In	1	0	0	1	3	1	1		0	2	3
Outside	5	7	2	1	0	2	5		1	0	0
Syracuse U. In	11	4	6	8		0	2		3	6	2
Outside	2	3	3	0		1	0		0	7	0
U. of Iowa In	6	0	0	2		2	6	2	1	2	2
Outside	0	1	1	0		0	0	0	0	3	0
U. of Minnesota In	13	10	3	2	0	4	5	3	6	2	2
Outside	5	3	3	0	2	1	0	0	3	6	0

clearly demonstrate the type of faculty preparation considered necessary for teaching in graduate programs in instructional systems. Furthermore, the content areas of measurement and evaluation and management also receive more emphasis in faculty preparation than the educational media content areas (other than visual). In fact, the programs at Pennsylvania State University and Syracuse University do not offer course work in either video or audio. The medium of computer is represented in all but one program. Only the visual medium is represented in all programs.

### Program Goals

Interpretation of data concerning these programs must consider the goals of the various programs. Respondents were asked to provide statements about the following categories: goals of the master's program, goals of the doctoral program, goals of any other degree programs, and planned goal changes.

#### *Master's degree programs*

For most of the schools surveyed, the master's degree represents an applied program leading to a career as an instructional developer in business and industry. For example, the programs at Florida State University and the University of Minnesota prepare specialists in the development of instructional materials and in the use of educational media. Few programs identified, as a program goal, the application of the master's degree in a public school setting. The goal structure of the programs focused in large part on learning environments not traditionally associated with graduate study in education.

In all cases, the master's work was deemed appropriate study for those enroute to a doctorate. The master's degrees offered through graduate programs in instructional systems can be characterized as emphasizing training in instructional development and/or media production. The doctoral programs, on the other hand, emphasize what can be best described as research activities.

#### *Doctoral degree programs*

The goals of the doctoral programs are not simply an extension of the master's programs but represent a set of competencies associated with conventional doctoral work—that is, advanced study in research methodology to advance knowledge in the area of speciali-

zation within instructional systems. Each program indicated that training leading to the doctorate degree will enable the student to teach and conduct disciplined inquiry in instructional systems. Brigham Young University stated that the goal of its doctoral program in Instructional Science and Technology is to "... create in one person a balanced research-development-evaluation approach with commitment to (a) scholarly productivity oriented to professional colleagues, (b) development of conceptually sound and empirically validated instructional products at either prototype or operations level and, (c) sophistication in both values and measurement areas to yield sound field and theoretical evaluation products." The other programs express basically the same set of themes.

#### *Goals of other degree offerings*

Degrees offered other than the master's (of arts or science) and PhD or EdD range from the Media Generalist Certification program at the University of Minnesota to the Specialist in Education degree at Brigham Young University. The Media Generalist program at Minnesota is typical of certification efforts found in instructional systems graduate programs. Its goal is to "develop school leaders in the area of educational media (including library science)." The Specialist in Education degree offered by Brigham Young University is more production oriented than its Doctor of Education degree and omits the final year of study required for that degree. A reading of the goals of such programs show a definite trend away from basic media applications towards application of curriculum design, instructional development, and evaluation within a framework of management skills.

#### *Planned Goal Changes*

Several of the instructional systems programs are anticipating goal changes that illustrate a divergence of ideas, rather than a convergence as might be expected. Syracuse University plans increased emphasis on disciplined inquiry at both the master's and doctoral levels. Brigham Young, on the other hand, will place increased emphasis on evaluation at all levels of study while decreasing the emphasis on service level media, while Ohio State University plans "increased emphasis on school media specialist at the master's." In general, the older programs implied that

goal changes are coming and that program curriculum will be affected. The newer programs indicated a strengthening of what they defined as the mission of their programs with no foreseen changes in program emphasis within the next 5 years.

### Curriculum and Course Offerings

To determine the number and type of courses offered within a program's curriculum, instructional systems programs were queried about the number and type of courses (a) offered within the master's and doctoral programs, (b) required in the program but not under its control, and (c) under development. Categories of course type are based on those described by Tennyson (1977). The educational media category was subdivided into four subcategories: video, visual, audio, and computer.<sup>2</sup>

While faculty assignments show that the categories of instructional development, instructional psychology, and visual technology (educational media) were the most heavily staffed (Table 2), the actual number count of courses offered in the programs indicates some rather sharp contrasts. Instructional development still dominates with 66 courses offered within the program, but the number of courses in instructional psychology and visual technology drop to 40, with course counts of 27 to 39 respectively (Table 3).

Three schools, Florida State University, University of Minnesota, and Syracuse University, offer over twice as many courses in instructional development as the other schools. The growing importance of management is demonstrated by the fact that each program offers at least one course in management, and the total number of courses in management approximate those for instructional psychology and visual technology. Even though measurement and evaluation represent a small number of courses in terms of number of total course offerings, each school offers at least one course in this area.

In the category of educational media, visual courses predominate (with Indiana assuming a fourth of the total), followed by computer and video courses, which are offered in most programs. The University of Minnesota

<sup>2</sup>The category "educational media" was called "educational technology" in the survey form completed by the respondents. Subcategories within this category remain the same.

seems to focus on computer related courses such as Indiana University emphasizes visual courses. Course work in research and statistics is common to all programs as either a part of the program curriculum or an outside requirement. Internship experience on an actual credit basis is practiced by five of the nine surveyed programs.

All programs use courses from outside the formal confines of their own program. Brigham Young University, for example, is typical in that it offers 32 courses within their program and 22 outside the program. Ohio State University was the only school contacted with more courses required outside of the program (23) than are offered within the program (12).

All content areas, except for research and statistics, receive greater representation in terms of the number of courses offered within the programs than outside the program. The research and statistics content areas receive more emphasis in terms of course offerings outside the program than within the program. This indicates a disparity between the emphasis placed on research competencies (Table 4) and the number of courses offered within the program.

#### Student Competencies

As a measure of the extent to which the curriculum reflects competency statements about student learning, programs were asked to complete the following statement for each of the areas comprising advanced academic study in instructional systems: "A student in our program is expected to be competent in . . ." Following this statement was a list of content areas with a ranking of the emphasis that they receive in the master's and doctoral degree programs. These were then assimilated under the following categories suggested by Tenyson (1977).

- (a) Instructional Development
  - The development of a unit (course or program) of instruction
  - The development of a curriculum
- (b) Instructional Psychology
  - Theories of learning
  - Data analysis
  - Theories of Instruction
  - Experimental design
- (c) Management and administration
  - The management of programs and personnel
  - The management of media resources
  - The administration of programs and personnel

- (d) Measurement and evaluation
  - Test and measurement techniques
  - Course evaluation
  - Product evaluation
  - Program evaluation
- (e) Educational media: the production of media materials: video, audio, computers, visual.
- (f) Evaluation of media materials
- (g) The use of media equipment
- (h) Design of media hardware facilities
- (i) The use of media equipment: video, audio, computers, visual.

Ratings of emphasis were from 1 (low) to 5 (high). Means were computed on the ratings given each *group* of statement (e.g., all statements concerning "instructional psychology") by the individual respondents. The groups of statements were then ranked according to the emphasis received in each program (Table 5). Actual numerical rankings are valid only for an examination of emphasis *within* the individual programs; program comparisons cannot be made on the basis of the numerical ranking. However, contrasts among programs can be made according to the rank ordering of the five areas.

In the master's program, four of the responding schools ranked instructional development as the competency receiving highest emphasis within their programs. Two schools ranked instructional development as low as fourth. In both of these schools, Arizona State University and Brigham Young University, the competency of educational media was ranked first. Pennsylvania State University identified instructional psychology as its first competency while Indiana University ranked it as least important; Minnesota ranked measurement and evaluation first while three schools placed it fifth; and Syracuse selected management and administration as receiving greatest emphasis while three other programs ranked it least important. These data are consistent with the previous information on faculty assignments and course offerings in that instructional development is the primary focus of the master's degree in instructional systems, with the emphasis on the other content areas varying according to the design of the individual program.

Competencies associated with the content area of instructional psychology seem to be the focus of doctoral programs in instructional systems. Five of the programs ranked instructional psychology first and instructional development competencies second. With the

exception of Pennsylvania State University, all programs ranked educational media higher in the master's program than in the doctoral program. Indiana University follows its first competency ranking of instructional development with management and administration, educational technology, measurement and evaluation, and instructional psychology. In an almost complete reversal of this pattern, Pennsylvania State University ranks the competencies (in order of emphasis) as instructional psychology, measurement and evaluation, educational technology, instructional development, and management and administration. The traditional view of the doctorate as a research oriented degree is clearly demonstrated in the placement of the management and administration competency. In five of the programs, management and administration ranks lower as a competency in the doctoral programs than in the master's. In three cases it is ranked the same, and it is higher in only one. Thus, the instructional systems programs surveyed emphasize the traditional roles of graduate degrees; that is, the master's is an applied degree while the doctorate is a research degree.

#### Placement of Program Graduates

As a part of this review, respondents were asked to identify the types of employment their graduates have obtained within the last 3 years. The results of this section indicate the emphasis of the individual programs and provide an indication of employment opportunities in the area of instructional systems.

Both Brigham Young University and Ohio State University rank elementary and secondary education as being the largest employer of graduates from the master's program which is interesting in light of the fact that the program goals do not emphasize the preparation of master's students for employment in these areas. The University of Minnesota ranks business and industry as the largest employer of graduates from its master's program, while elementary and secondary education rank second.

Overall, the health sciences employ the largest number of graduates from master's programs. All respondents ranked the health sciences as the second or third largest employer of master's graduates. The only category of employment that hired no master's graduates is that of the 4-year colleges.

Two other categories were indicated in response to the query about the

**TABLE 4**  
**Ranking of Instructional Systems Programs Based**  
**On Ratings Given Student Competency Statements**

Institution	Masters	Doctorate
Arizona State U.	Educational Technology - 3.8 Management and Administration - 3.1 Instructional Psychology - 2.8 Instructional Development - 2.0 Measurement and Evaluation - 1.5	Educational Technology - 4.0 Instructional Development - 3.5 Management and Administration - 2.9 Instructional Psychology - 2.7 Measurement and Evaluation - 1.9
Brigham Young U.	Educational Technology - 3.8 Management and Administration - 3.3 Measurement and Evaluation - 2.7 Instructional Development - 2.5 Instructional Psychology - 1.5	Measurement and Evaluation - 4.2 Instructional Development - 4.0 Instructional Psychology - 3.7 Management and Administration - 2.6 Educational Technology - 1.5
Florida State U.	Instructional Development - 4.5 Measurement and Evaluation - 3.0 Instructional Psychology - 2.8 Educational Technology - 2.5 Management and Administration - 1.0	Instructional Development - 5.0 Measurement and Evaluation - 4.5 Instructional Psychology - 3.7 Management and Administration - 3.0 Educational Technology - 2.5
Indiana U.	Instructional Development - 5.0 Management and Administration - 4.6 Educational Technology - 3.7 Measurement and Evaluation - 3.7 Instructional Psychology - 3.0	Instructional Development - 5.0 Management and Administration - 4.3 Educational Technology - 4.1 Measurement and Evaluation - 4.0 Instructional Psychology - 3.0
Ohio State U.	Instructional Development - 4.0 Management and Administration - 3.3 Educational Technology - 2.8 Instructional Psychology - 2.2 Measurement and Evaluation - 2.0	Instructional Psychology - 4.7 Instructional Development - 3.0 Measurement and Evaluation - 3.0 Management and Administration - 2.0 Educational Technology - 1.5
Pennsylvania State U.	Instructional Psychology - 4.5 Measurement and Evaluation - 4.5 Instructional Development - 4.0 Educational Technology - 3.6 Management and Administration - 1.0	Instructional Psychology - 4.5 Measurement and Evaluation - 4.5 Educational Technology - 4.2 Instructional Development - 4.0 Management and Administration - 3.0
Syracuse U.	Management and Administration - 4.0 Educational Technology - 3.7 Instructional Development - 3.5 Instructional Psychology - 3.2 Measurement and Evaluation - 3.0	Instructional Psychology - 5 Measurement and Evaluation - 4.2 Instructional Development - 3.5 Management and Administration - 2.5 Educational Technology - 2.3
U. of Iowa	Instructional Development - 4.0 Measurement and Evaluation - 3.3 Educational Technology - 2.8 Instructional Psychology - 2.5 Management and Administration - 2.3	Instructional Psychology - 4.0 Instructional Development - 3.0 Measurement and Evaluation - 2.5 Educational Technology - 2.2 Management and Administration - 2.0
U. of Minnesota	Measurement and Evaluation - 4.7 Instructional Development - 4.5 Instructional Psychology - 3.5 Management and Administration - 3.0 Educational Technology - 2.8	Instructional Psychology - 5.0 Instructional Development - 5.0 Measurement and Evaluation - 4.5 Educational Technology - 3.3 Management and Administration - 3.0

employment of master's graduates. Florida State University listed its own doctoral program as the largest employer of its graduates, and Brigham Young University listed church education as the second largest employer of graduates from the master's program.

*Doctoral Employment*

The largest employment areas of graduates from the doctoral programs are university teaching (ranked first by Ohio State University, Syracuse University, and Florida State University) and the military (ranked first by Pennsyl-

vania State University and Arizona State University). Exceptions to these categories are the university service centers, which employed the largest number of Brigham Young University doctoral graduates, and the single doctoral graduate at the University of

**TABLE 5**  
**Ranking of Student Competencies in an Ideal Program**

Institution	Masters	Doctorate
Brigham Young U.	<ol style="list-style-type: none"> <li>1 -- Development of a curriculum.</li> <li>2 -- Experimental design.</li> <li>3 -- Theories of instruction.</li> <li>4 -- Theories of learning.</li> <li>5 -- The management of programs and personnel.</li> <li>6 -- The administration of programs and personnel.</li> <li>7 -- The use of media equipment: video.</li> <li>8 -- The use of media equipment: visual (photographic, graphics).</li> <li>9 -- Course evaluation.</li> <li>10 -- Program evaluation.</li> </ol>	<ol style="list-style-type: none"> <li>1 -- Development of a unit (course or program) of instruction.</li> <li>2 -- Development of a curriculum.</li> <li>3 -- Product evaluation.</li> <li>4 -- Course evaluation.</li> <li>5 -- Evaluation of media materials.</li> <li>6 -- Program evaluation.</li> <li>7 -- Design of media hardware/facilities.</li> <li>8 -- Data analysis.</li> <li>9 -- Theories of instruction.</li> <li>10 -- Experimental design.</li> </ol>
Florida State U.	<ol style="list-style-type: none"> <li>1 -- Development of a unit (course or program) of instruction.</li> <li>2 -- Development of a curriculum.</li> <li>3 -- Test and measurement techniques.</li> <li>4 -- Theories of learning.</li> <li>5 -- Theories of instruction.</li> <li>6 -- Product evaluation.</li> <li>7 -- Program evaluation.</li> <li>8 -- Course evaluation.</li> <li>9 -- Evaluation of media materials.</li> <li>10 -- Use of computers.</li> </ol>	<ol style="list-style-type: none"> <li>1 -- (Other) Needs assessment/analysis.</li> <li>2 -- (Other) Design of instructional systems.</li> <li>3 -- Development of a unit (course or program) of instruction.</li> <li>4 -- Theories of learning.</li> <li>5 -- Program evaluation.</li> <li>6 -- Development of a curriculum.</li> <li>7 -- Product evaluation.</li> <li>8 -- Evaluation of media materials.</li> <li>9 -- Theories of instruction.</li> <li>10 -- Course evaluation.</li> </ol>
Indiana University	<ol style="list-style-type: none"> <li>1 -- Development of a curriculum.</li> <li>2 -- Development of a unit (course or program) of instruction).</li> <li>3 -- The use of media equipment: visual.</li> <li>4 -- Evaluation of media materials.</li> <li>5 -- Production of media materials: visual.</li> <li>6 -- The management of media resources.</li> <li>7 -- The management of programs and personnel.</li> <li>8 -- The administration of programs and personnel.</li> <li>9 -- Design of media hardware/facilities.</li> <li>10 -- Product evaluation.</li> </ol>	<ol style="list-style-type: none"> <li>1 -- Development of a curriculum.</li> <li>2 -- Development of a unit (course or program) of instruction.</li> <li>3 -- The use of media equipment: visual.</li> <li>4 -- Production of media materials: visual.</li> <li>5 -- Theories of instruction.</li> <li>6 -- Evaluation of media materials.</li> <li>7 -- The management of media resources.</li> <li>8 -- The management of programs and personnel.</li> <li>9 -- Product evaluation.</li> <li>10 -- The administration of programs and personnel.</li> </ol>
Syracuse U.	<ol style="list-style-type: none"> <li>1 -- Experimental design.</li> <li>2 -- Theories of learning.</li> <li>3 -- Test and measurement techniques.</li> <li>4 -- Data analysis.</li> <li>5 -- Theories of instruction.</li> <li>6 -- Program evaluation.</li> <li>7 -- The management of programs and personnel.</li> <li>8 -- Development of a curriculum.</li> <li>9 -- Course evaluation.</li> <li>10 -- Production of media materials.</li> </ol>	<ol style="list-style-type: none"> <li>1 -- Experimental design.</li> <li>2 -- Theories of learning.</li> <li>3 -- Test and measurement techniques.</li> <li>4 -- Data analysis.</li> <li>5 -- Theories of instruction.</li> <li>6 -- Program evaluation.</li> <li>7 -- Course evaluation.</li> <li>8 -- Product evaluation.</li> <li>9 -- All others.</li> </ol>
U. of Iowa	<ol style="list-style-type: none"> <li>1 -- Development of a unit (course or program) of instruction.</li> <li>2 -- Evaluation of media materials.</li> <li>3 -- Management of media resources.</li> <li>4 -- Product evaluation.</li> <li>5 -- Production of media materials: visual.</li> <li>6 -- Production of media materials: video.</li> <li>7 -- Production of media materials: audio.</li> <li>8 -- Theories of instruction.</li> <li>9 -- Test and measurement techniques.</li> <li>10 -- The management of programs and personnel.</li> </ol>	<ol style="list-style-type: none"> <li>1 -- Development of a curriculum.</li> <li>2 -- Theories of instruction.</li> <li>3 -- Program evaluation.</li> <li>4 -- Experimental design.</li> <li>5 -- Course evaluation.</li> <li>6 -- Administration of programs and personnel.</li> <li>7 -- Development of a unit (course or program) of instruction.</li> <li>8 -- Evaluation of media materials.</li> <li>9 -- Data analysis.</li> <li>10 -- Theories of learning.</li> </ol>
U. of Minnesota	<ol style="list-style-type: none"> <li>1 -- Development of a unit (course or program) of instruction.</li> <li>2 -- Theories of instruction.</li> <li>3 -- Product evaluation.</li> <li>4 -- Program evaluation.</li> <li>5 -- Development of a curriculum.</li> <li>6 -- Theories of learning.</li> <li>7 -- Course evaluation.</li> <li>8 -- Evaluation of media materials.</li> <li>9 -- Test and measurement techniques.</li> <li>10 -- Management of media resources.</li> </ol>	<ol style="list-style-type: none"> <li>1 -- Theories of instruction.</li> <li>2 -- Theories of learning.</li> <li>3 -- Data analysis.</li> <li>4 -- Experimental design.</li> <li>5 -- Test and measurement techniques.</li> <li>6 -- Product evaluation.</li> <li>7 -- Program evaluation.</li> <li>8 -- Course evaluation.</li> <li>9 -- Development of a unit (course or program) of instruction.</li> <li>10 -- Development of a curriculum.</li> </ol>

Minnesota who is employed in the health sciences.

### Competencies in an Ideal Program

The questionnaire concluded with a list of 30 content areas associated with instructional systems and asked the respondents to rank the areas as if selecting competencies in an ideal program. Table 5 lists each program's top ten content areas. The purpose was to contrast the actual curriculum with what the respondents consider ideal.

Content areas identified by most of the respondents as being part of the competencies necessary for both the master's and doctoral degrees in an ideal program are development of a unit of instruction, development of a curriculum, theories of instruction, theories of learning, course evaluation, program evaluation, product evaluation, and evaluation of media materials. These content areas bear close resemblance to the course offerings in those programs surveyed. The main emphasis of graduate education in instructional systems consists of competencies related to instructional (and curriculum) development, evaluation, and psychological principles of learning and instruction. Theories of instruction was the only content area listed in the top ten competencies by all programs. Every program had at least two types of evaluation competencies for each degree. One program, Syracuse University, did not include development of a curriculum or unit of instruction as a competency in the ideal doctoral program. Instead, it listed that competency in the ideal master's program with the stipulation that such a competency (development of a curriculum or unit of instruction) be considered prerequisite to study for the doctoral degree. The rankings of these two areas varied from 1 (University of Iowa) to 10 (University of Minnesota). In the master's program, Iowa did not rank development of a curriculum, while Minnesota ranked it fifth. Theories of instruction had a similar range of rankings, with only the evaluation areas showing consistency in the

order of ranking. Evaluation competencies were usually ranked fifth to tenth in the ideal master's program, with a slight increase in the doctorate.

Only two other content areas gained sufficient rankings to make the top ten in most programs. These are the competencies of management and quantitative skills. The management and administration of programs and personnel and the management of media resources appear in a number of master's programs, while Indiana University and the University of Iowa were the only programs to include these areas in their ideal doctoral programs. In contrast to the management and administration emphasis shown by both Indiana and Iowa is the emphasis on quantitative competencies indicated by the rankings of the University of Minnesota and Syracuse University. While the other programs included these areas toward the low end of their rankings of the competencies (if included at all), Minnesota and Syracuse ranked them in the top five positions in their ideal doctoral program. Syracuse placed similar emphasis on those competencies in the ideal master's program. Although certain programs indicated possible curricular changes within the next 5 years, the ideal programs mirror the goals and competencies emphasized in the present curriculum.

### Conclusion

While demographic characteristics vary among programs, competencies and content emphasized in graduate study in instructional systems are common to a number of programs. For example, the master's degree is intended to prepare students for employment as instructional developers in business and industry. There is a noticeable lack of emphasis on preparation for employment in public or private elementary or secondary school settings, which is uncharacteristic of the typical master's degree program in education.

Doctoral programs in instructional systems exhibit more variability in the areas of content, competencies, and the emphasis of competencies in an ideal

program than do master's degree programs. Each program, along with an individual emphasis in a particular component of instructional systems, stresses research methodology. Thus, the faculties within the various programs and their respective graduates can pursue knowledge in instructional systems on a range of concerns.

The most significant characteristic of the instructional systems programs surveyed is the nature of the curriculum and course offerings. Instructional development courses overwhelmingly outnumber all other courses, with secondary areas of emphasis being instructional psychology, visual technology, management, and research. The emphasis placed on content and competencies other than media is an indication of the present direction of instructional systems. Although many of the programs evolved from an earlier audio-visual orientation, present programs now represent a concern with process rather than product and show a healthy diversity of content emphases within instructional systems.

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