

An Alumni-Practitioner Review of Doctorial Level Competencies in Instructional Systems

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Introduction

The design and development of a graduate program in Instructional Systems is based upon an assessment of need for the program and the experience base of the faculty. These are combined to produce a program which will serve many kinds of clients. Under the best of circumstances, such a program will undergo a variety of types of formative evaluation which will make it more effective. The purpose of this article is to describe one set of procedures used by Florida State University (FSU) to formatively evaluate its doctoral program and to suggest the generalizability of the findings to other doctoral programs.

In 1979, a study was conducted which included all 76 PhD graduates of the FSU Instructional Systems (IS) program. The program had been officially in existence since 1973. The study was conducted in two phases. The first was a mail survey of all graduates asking each to rate the competencies intended as objectives of the FSU program on the basis of their frequency of use and importance on the job. A full description of the competencies, their derivation, and role in the degree program is reported by Boutwell (1977).

The second phase of the study involved a conference at FSU which was attended by ten specially designated graduates of the program. These gradu-

ates reviewed the results of the survey for their career field (e.g., the results of those graduates working in industry) and then prepared a consensus report for the group.

This report provides background as to the alumni derivation of instructional systems competencies for various career fields, a description of the survey instrument and methodology used in evaluating the program, a summary of the results of the study, and a description of modifications made in the program subsequent to the study.

Derivation of Competencies

The Instructional Systems doctoral program has been designed to meet the needs of students who enter a variety of professional positions following their graduation. The specific career fields in which IS graduates are expected to be employed range from typical university professorial and research positions to positions in industry and government.

In 1973, the IS faculty drew upon their combined experiences in the field and upon logical analysis to derive a set of "competency areas" which are presumably required at entry level for the specified career fields. As shown by Table 1, these competency areas were classified either as core (essential for all career fields) or as specialty (essential for certain career fields but not for others.)

The competencies are provided in Table 3 in somewhat more detail in the form of questions asked of the graduates. While the derivation of these competencies predates the AECT Task Force on Instructional Development Certification efforts to define a set of competencies for possible certification of instructional designers, there is an almost total overlap between the two sets of competencies. (See Bratton, 1981). While various graduate programs place emphasis on different clusters of these competencies (Silber, 1982), the overall similarities are substantial.

The faculty estimated which com-

petency areas were required by each career field and where emphasis should be placed in the acquisition of particular expertise for each field. In order to define and describe more precisely what is included in each competency area, the IS program faculty established objectives at the knowledge and skill levels. Knowledge level objectives specify information that a student should be able to state; skill level objectives describe application type behaviors that a student should be able to perform. These objectives have been the basis for course content and other educational experiences that make up the FSU doctoral program called Instructional Systems.

Procedures

Questionnaire Development

In order to survey the graduates of the FSU doctoral program in Instructional Systems, a questionnaire was constructed by a faculty committee. The major portion of the questionnaire, as shown in Table 3, was based on an expanded list of competency domains which define the present doctoral program. Respondents were asked to indicate whether or not they, in their current jobs, perform tasks in each of the competency domains. They were also asked to report the frequency of task performance and the proportion of time spent performing specific tasks. Additional sections of the questionnaire were included to determine the respondents' involvement in research on instructional design theory and models and their projections of critical skills needed by them in the next 10 years. Supplemental comments were also encouraged. Before the questionnaire was distributed to all graduates it was reviewed by several faculty members and by 10 alumni, and was revised in accordance with their recommendations.

Population

The questionnaire was sent to all 76 FSU doctoral alumni graduated since the

start of the program (including those who reviewed it). Of the 53 questionnaires sent out to U.S. doctoral alumni, 50 were returned. Nine questionnaires were returned from the 23 international graduates. For purposes of this paper, only the results of the U.S. alumni are reported.

The 50 U.S. alumni respondents were employed in 20 states and several countries of South America. They were distributed among employer classifications as shown in Table 2.

Overall, the mean number of years since graduation of the respondents was 4 years, with a mean of 3.5 years of service in their current job. The distribution of years of service on their current job is shown in Figure 1.

Conference of Graduates

In addition to the information gathered from the questionnaire, the faculty also selected 10 alumni to come to Florida State for an in-depth review of the program. Each graduate represented a major career field in Instructional Systems. Before the conference, participants were mailed information about the purpose of the meeting, a list of the competency domains and specific objectives under each, and a summary of the questionnaire data for the career field they represented. During their meeting, the alumni studied questionnaires and data summaries for their particular career fields and consulted with faculty members. Then they wrote individual reports which related the competency domains presently taught in the program to those needed on the job in specific career areas. Later in the meeting, group

Table 1
Areas of Competence^a

Competency Area	Comment
A. Needs Analysis	Specialty
B. Job Analysis	Specialty (e.g., military training, teacher education)
C. Goal Definition	Core
D. Learning Task Analysis	Core
E. Definition of Objectives	Core
F. Appraising Resources, Constraints	Specialty
G. Instructional Materials Development	Core
H. Selecting Media	Core
I. Instructional Delivery Procedures	Core
J. Adapting, Marketing, Utilization Strategies	Specialty
K. Designing Teacher Materials in Education	Specialty
L. Student Assessment Procedures	Core
M. Formative Evaluation; Program Revision	Core
N. Summative Evaluation	Core
O. Project and Program Management	Specialty
P. Research Design	Specialty

^a The above is considered a comprehensive list of competency areas in the instructional systems field. Some are more generally useful than others, within the range of career fields listed in Table 2. Comments on the areas are intended to indicate whether each is a "specialty" or a "core" area. In general, the former term implies that the area of competence is considered essential for certain career fields, and not for others. "Core" means considered essential for all career orientations.

discussion among the alumni resulted in a consensus report. This was presented orally to an audience of faculty, students, alumni, and other interested members of the community.

Survey Findings

The response of the 50 U.S. alumni to the questionnaire were tallied as a total group for each of the 22 competency do-

main described in the FSU Instructional Systems program. Table 3 lists each competency domain indicating how many alumni find a requirement for these competencies in their jobs, the degree to which they are called on to exhibit each competency (use mode on a scale of 1 to 4), and a rank-order rating of the competencies viewed as having greatest importance to these alumni in the next 5-10 years.

For 21 of the 22 competency areas in the questionnaire, a majority of respondents affirmed the requirement for the competencies. Thus, we concluded that these competency domains are actually in use by more than half of the Instructional Systems graduates presently on the job. The competency domains with the highest percentages of respondents answering affirmatively were: human psychology, data handling, needs analysis, describing objectives, and project and program management. A group of competency domains which were almost as frequently named as being part of the respondents' work included: goal definition, learning task analysis, instructional materials development, selecting/developing media, interpersonal communication and consulting, designing training workshops, selecting/developing learner assessment

Table 2

Number of IS Doctoral Alumni by Career Area

CAREER AREA	NUMBER
1. R & D Organization (Funded Projects)	6
2. Instructional Development Bureau	8
3. Teacher Education Center (Public Schools)	4
4. Medical/Professional School	5
5. Military/Industrial Training Development	14
6. Instructional Research Department (University)	8
7. International Development Organization	1
8. State Department of Education	4

Note: Total number of alumni responding = 50

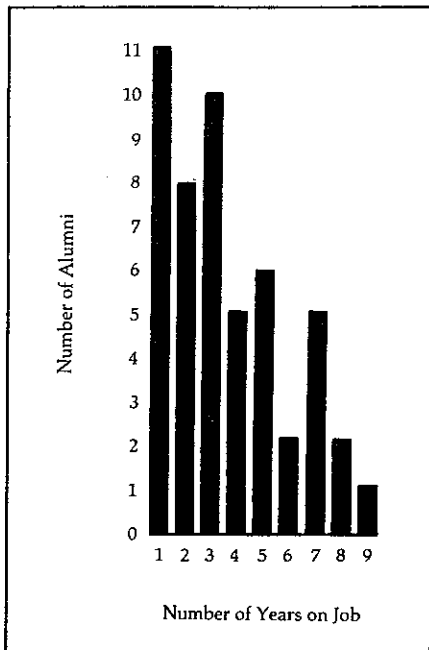


Figure 1. IS Doctoral alumni by number of years on current job. (Mean number of years on current job = 3.5)

instruments, formative evaluation, and general management. The only one of the 22 skill areas which is used by less than half (30%) of the population is research on improvement of instructional design theory and models.

Consensus Report of Alumni

In their oral report to the faculty and student, the alumni first emphasized their general high regard for the existing program at FSU. They mentioned particular strengths: the opportunities to participate in internship experiences during which students could try out their newly emerging skills in actual R & D environments; the role models provided by the faculty; and the collegial atmosphere, in which students were treated like professionals. These experiences were reported as relating positively to success on the job.

The panel then discussed the list of core competencies. All of those previously identified in the questionnaire seem to be useful to professionals in the field—no deletions were suggested. Even in cases in which alumni are presently performing mainly management functions rather than the technical work of instructional design and development, they still need expertise in these technical skills to supervise and train others. The research emphasis of the PhD in Instructional Systems was viewed as distinctly beneficial, even by those who are basi-

Table 3

Questionnaire Summary Instructional Systems Design Competencies

Below are listed 22 competencies described in the Instructional Systems Program and the percentage of alumni claiming a requirement for these competencies exists in their work. Also indicated is the modal frequency of use of the competency and a rank order rating of which competencies are viewed of greatest importance to these alumni in the next 5-10 years.

	% of Alumni Using Competency	Use ^a Made	Rank Order
Psychological Foundations			
1. As part of your job, do you directly use knowledge of <i>human psychology</i> ?	88	4	17.5
Data Handling-Statistics			
2. As part of your job, do you use, choose or interpret statistical measures?	86	2	14.5
Needs Analysis			
3. Does your job require collection, use or interpretation of data dealing with needs or requirements?	88	2	6.5
Job Analysis			
4. As part of your job, do you prepare job descriptions or task descriptions?	66	2	17.5
Goal Definition			
5. As part of your job, are you required to derive and describe instructional goals?	82	2	14.5
Learning Task Analysis			
6. As part of your job, do you analyze instructional objectives into subordinate skills?	84	2	8
Describing Instructional Objectives			
7. As part of your job, do you use or do you teach people to use, objectives which are ambiguously described?	92	3	12.5
Instructional Materials Development			
8. As part of your job, do you design and/or develop instructional materials?	80	3	4.5
Selecting or Developing Media			
9. As part of your job, do you develop or specify selection and use of media for instruction?	78	2	19.5
Scripting/Authoring			
10. As a part of your job, do you write or edit copy of instructional materials?	76	2	19.5
Instructional Delivery Procedures			
11. As part of your job, do you design and develop instructional delivery procedures?	74	2	9
Adapting, Marketing, Utilization Strategies			
12. As part of your job, do you deal with adaptation, marketing or utilization of instructional products?	60	2	12.5
Interpersonal Communication and Consulting Skills			
13. As part of your job, do you act as a consultant to other organizations?	84	4	2
Designing Training Workshops			
14. As a part of your job, do you develop training workshops?	80	2	3
Student Assessment Procedures			
15. As part of your job, do you select or develop tests for assessing learning outcomes?	84	2	10.5
Formative Evaluation; Program Revision			
16. As part of your job, do you conduct formative evaluation studies and use the data for program revision?	82	2	6.5
Summative Evaluation			
17. As part of your job, do you specify the use, and interpret measures of, summative evaluation?	60	2	21
Project and Program Management			
18. As part of your job, do you deal with the management of grant, contracts, or other funded projects?	88	4	1
General Management			
19. As a part of your job, do you manage the work of others or other aspects of your organization that affect others?	84	4	4.5
Cost/Benefit - Effectiveness Techniques			
20. As a part of your job, do you describe the costs, benefits or effectiveness of instructional or organizational programs or make decisions based on such analyses?	64	2	10.5
Research Design			
21. As part of your job, are you involved with the design and conduct of systematic investigation?	60	2	16
Research on Improvement of Instructional Design Theory			
22. As part of your job, are you involved with research specifically related to testing of hypotheses involving instructional design theory and models?	30	2	22

^a Use Mode indicates the modal response of how often the behavior or task is performed using the following scale of 1-4:

- 1 = never
- 2 = less than once per month
- 3 = at least monthly, but less than twice per week
- 4 = twice per week or more

cally consumers of research findings.

Three recommendations were made by the panel emphasized certain items in the competency domain list. One recommendation concerns the area of "adapting, marketing, utilization strategies" as identified on the questionnaire. This competency area appears to combine a number of skills which could be identified and separately analyzed. For example, the concept of marketing is a complex one which could include the selling of ideas as well as products. The skills in this cluster are thought to be quite important, particularly in industrial settings.

The second area of concern involves a distinction between formative evaluation, measurement, and testing on the one hand, and the broader area of the program evaluation and policy analysis on the other. The alumni stated that in their jobs they were often called upon to do both types of evaluation.

The third competency area, one which was stressed again and again in the consensus report, was that of generic skills: communication—written, oral, interpersonal relations; and management, including budgeting and supervising. These skills are critical and frequently used. While many of these can be learned on the job, the alumni felt that preparation in this area during graduate school is most beneficial.

Several competencies in the "specialty" category were mentioned by the alumni. They believed that instruction should be offered in the following competency areas:

1. Working as a change agent in a hostile environment.
2. Special problems of women in the projected work environment.
3. Nonformal education, especially for international employment.
4. Policy implications of instructional design and development issues and educational research issues.
5. Program and project management in a corporate environment.
6. Critiquing and reviewing skills (needed primarily in academic positions).
7. Developing CAI and CMI, as well as broad knowledge about the uses of computers in education and training.

The consensus report recommended that since the employment future for PhD Graduates in Instructional Systems is optimistic, active recruiting by the program should be maintained, for example, among both teaching and supervisory personnel in the public schools.

The allied health professions are increasingly seeking instructional design skills. Persons with medical training and degrees in instructional systems would be very valuable. Remote degree programs would apparently be attractive to individuals employed in industry who could practice new skills on the job while taking coursework. International organizations and foreign countries continue to be sources for recruitment of students and placement of graduates.

Program Modifications

Following the 1979 alumni meeting, the FSU faculty began the task of curriculum revision, in an effort to incorporate the findings of the alumni study into the course and program changes required by the FSU conversion from a quarter system to a semester system. The faculty voted to retain set of core courses in the doctoral program which reflect the basic instructional design competencies endorsed by the alumni. In addition, a number of changes emerged in response to the alumni recommendations.

1. All doctoral students are now required to take, along with other typical Instructional Systems courses, courses in the dissemination and diffusion of ideas and products, formative evaluation of instruction, program evaluation, and basic management skills. New specialty courses have been added, as well as a biweekly seminar which serves as a forum for discussions of current topics in the field.

2. Two major career paths for graduates were identified: (a) university teaching and research, and (b) industrial training and development. Recommended courses, specialized internship experiences, and dissertation methodologies have been identified for each area.

Conclusions

This effort to draw on the experience of PhD alumni of the Instructional Systems program had valuable outcomes. To a considerable degree, this review confirmed faculty estimation of required competencies. Through the questionnaire and the alumni meeting, we learned that there were only a few gaps between academic training and the jobs graduates were obtaining. The faculty have attempted to sort through the alumni concerns in order to distinguish those which should result in program change from those which should be best addressed through on-the-job training. Obviously, this process of pro-

gram review is one that should be repeated at frequent intervals.

There appear to be two substantial implications for other programs in the field. The first relates to the methodology used in this study. It is not at all unusual to survey graduates with a questionnaire to determine the competencies they use on the job. The followup conference of graduates at Florida State, however, made a valuable contribution to the study. At the conference, participants reviewed and emphasized the high points of the survey as it applied to their circumstances and those in their career field.

Second, all doctoral programs should consider the expanded responsibilities of the Instructional System doctoral graduate, as depicted by the study. Skills in the design and development of instruction are certainly necessary, but according to the alumni, not sufficient for the graduate. The study pointed to a variety of general skills, such as management, and specialty skills, such as computers, which should be included in any doctoral program preparing graduates for industry and universities.

Notes

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