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ABSTRACT

This paper describes the 6-year effort (1979-1985) of the University of South Dakota School of Education to integrate microcomputer applications into the teacher education curriculum. For the purpose of describing changes in procedures and key factors over time, the activities during those years are grouped into three phases--awareness, development, and implementation--and presented in chart format with the key persons involved in each section identified. Two methods of faculty evaluation are described: a self-report study in which faculty were asked to report on their computer training, utilization, and attitudes; and the Stages of Concern Questionnaire (Hall, George and Rutherford), which was used to measure the involvement and acceptance of faculty toward the use of computers in their own classroom instruction at each of the six stages. Developed for the instructors as a guide for the coordination of instructional components across courses, a scope and sequence chart provides suggestions for teaching a specific computer content area at the freshman, sophomore, junior, senior, inservice, or prerequisite level. Concluding suggestions for critical factors to consider in implementing microcomputer innovations are divided into 14 "do" and 5 "don't" items. (JB)

Integrating Microcomputer Applications into Teacher Education

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Integrating Microcomputer Applications into Teacher Education

The 1984-85 academic year marks the sixth year of The University of South Dakota School of Education effort to integrate microcomputer applications into the teacher education curriculum. The activities during the past six years have been grouped into three phases for the purpose of describing changes in procedures and key factors over time. Figure 1 outlines these phases.

The initial phase of the project was a two year period during which the first microcomputer hardware was purchased by the School and efforts were begun to collect public domain and inexpensive software. During the following three years, the first priority was faculty development. A Microcomputer Task Force was formally established, which developed and delivered a computer literacy unit to faculty. This unit was also included in a required junior level course. During the third phase, systematic efforts have been made to integrate microcomputer applications into selected undergraduate courses. A scope and sequence (Figure 2) was developed for the instructors as a guide for the coordination of instructional components across courses. In addition, a microcomputer lab was estalished in the University library, equipped with 14 Apple IIe's.

The integration of microcomputer applications into the teacher education curriculum has been a slow process. It has largely been a "grass roots" innovation, with faculty recognizing the need for change and requesting assistance in the presence of rapid acceptance of microcomputers in the public schools and in society at large. In responding to faculty needs, the Microcomputer Task Force has provided leadership first in faculty development and secondly in curriculum revision efforts.

Other important characteristics of this innovation include a supportive administration in the School of Education, key persons with interest and skills in using microcomputers, and a modest budget for hardware, software, and faculty development costs.

Evaluation

A self-report survey and the Stages of Concern Questionnaire (Hall, George, & Rutherford, 1979) were used to assess faculty attitudes and practices (see Figures 3 and 4). Faculty were asked to report: (1) the kind of activities they have performed with a computer; (2) the classroom recordkeeping activities for which a computer is used; (3) the types of documents prepared personally or by secretarial staff using a word processing program; (4) the types of computer-related training taken in the past three years; and (5) the factors that have been a disadvantage in using computers in teaching and learning. The Stages of Concern Questionnaire measures the concerns of faculty about the use of computers in their own classroom instruction.

School of Education students' experience with computers in the classroom and their attitudes about microcomputer application in their future teaching setting have been measured through the use of a self-report survey completed in required courses at the sophomore, junior and senior levels.

Implications

Although the experiences of the School of Education have largely been evolutionary, certain factors have emerged as being critical to the change effort. These factors are listed in Figure 5.

Figure 1

Overall Time Line

Phase I: Awareness 1979-81	Phase II: Development 1981-84	Phase III: Implementation 1984-
Procedures:	Procedures:	Procedures:
*3 Apple II micros purchased	Informal meetings of interested faculty	*USD funds for curriculum revision project secured
Initial software collection begun	*Faculty Training Workshops (N=21)	Development and field-testing of units within courses
Summer Inservice Workshops conducted with Computer Science faculty	Visits to public school, higher education institution, and the state division of education	Data collection from students and faculty
Computer Science microcomputer lab created	Computer literacy unit for all junior education majors	Faculty training workshops (n=9, 20)
	Microcomputer applications integrated into science methods course, 2 graduate courses	State funds for PSED for demonstration lab and inservice training
	Software and print material ordered, evaluated and catalogued	5 IBM PC's for administrative and faculty use
	Microcomputer Task Force established	One-to-one assistance
	3 summer graduate workshops offered through School of Education	31% of faculty own personal computers
Key Actors:	Key Actors:	Key Actors:
Interested Educational Psychology faculty member	*Director of USD Educational Media Center made chair of Task Force	Educational Psychology faculty member
Director, Educational Research and Service Center (ERSC)	*Resource person from USD Ed Media Center	Interested faculty from Library Media, Special Education, HPER programs
Dean, School of Education	Interested Library Media faculty	Director, ERSC

*Critical Events/Actions/Actors

FIGURE 2

COMPUTER COMPETENCIES SCOPE AND SEQUENCE IN TEACHER EDUCATION

	YEAR IN PROGRAM					
CONTENT AREA	PREREQUISITE	FRESHMAN	SOPHOMORE	JUNIOR	SENIOR	INSERVICE
CARE AND HANDLING	X	X				X
WORD PROCESSING	X	X	X			X
LITERACY, HISTORY, APPLICATIONS	X		X			
INSTRUCTIONAL APPLICATIONS			X			X
SOFTWARE EVALUATION			X			X
SUBJECT MATTER SPECIFIC USES			X	X	X	X
MANAGING CLASSROOM USE					X	X

DELIVERY METHODS:
- SKILLS ACQUIRED IN HIGH SCHOOL OR ON OWN
- SELF-CONTAINED INSTRUCTIONAL UNITS
- COMPONENTS INTEGRATED INTO EXISTING COURSES
- NON-EDUCATION COURSES (E.G., COMPUTER SCIENCE)
- SEPARATE, NEW COURSE -- DESIRABLE BUT MAYBE NOT POSSIBLE

Figure 3

Stages of Concern About the Innovation[2]

0 AWARENESS: Little concern about or involvement with the innovation is indicated.

1 INFORMATIONAL: A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about herself/himself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.

2 PERSONAL: Individual is uncertain about the demands of the innovation, her/his inadequacy to meet those demands, and her/his role with the innovation. This includes analysis of her/his role in relation to the reward structure of the organization, decision making, and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.

3 MANAGEMENT: Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.

4 CONSEQUENCE: Attention focuses on impact of the innovation on students in her/his immediate sphere of influence. The focus in on relevance of the innovation for students, evaluation of student outcomes, including performance and competencies, and changes needed to increase student outcomes.

5 COLLABORATION: The focus is on coordination and cooperation with others regarding use of the innovation.

6 REFOCUSING: The focus is on exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.

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[2]Original concept from Hall, G.E., Wallace, R.C., Jr., & Dossett, W.A. *A developmental conceptualization of the adoption process within educational institutions*. Austin: Research and Development Center for Teacher Education, The University of Texas, 1973.

FIGURE 4

SCHOOL OF EDUCATION SoC

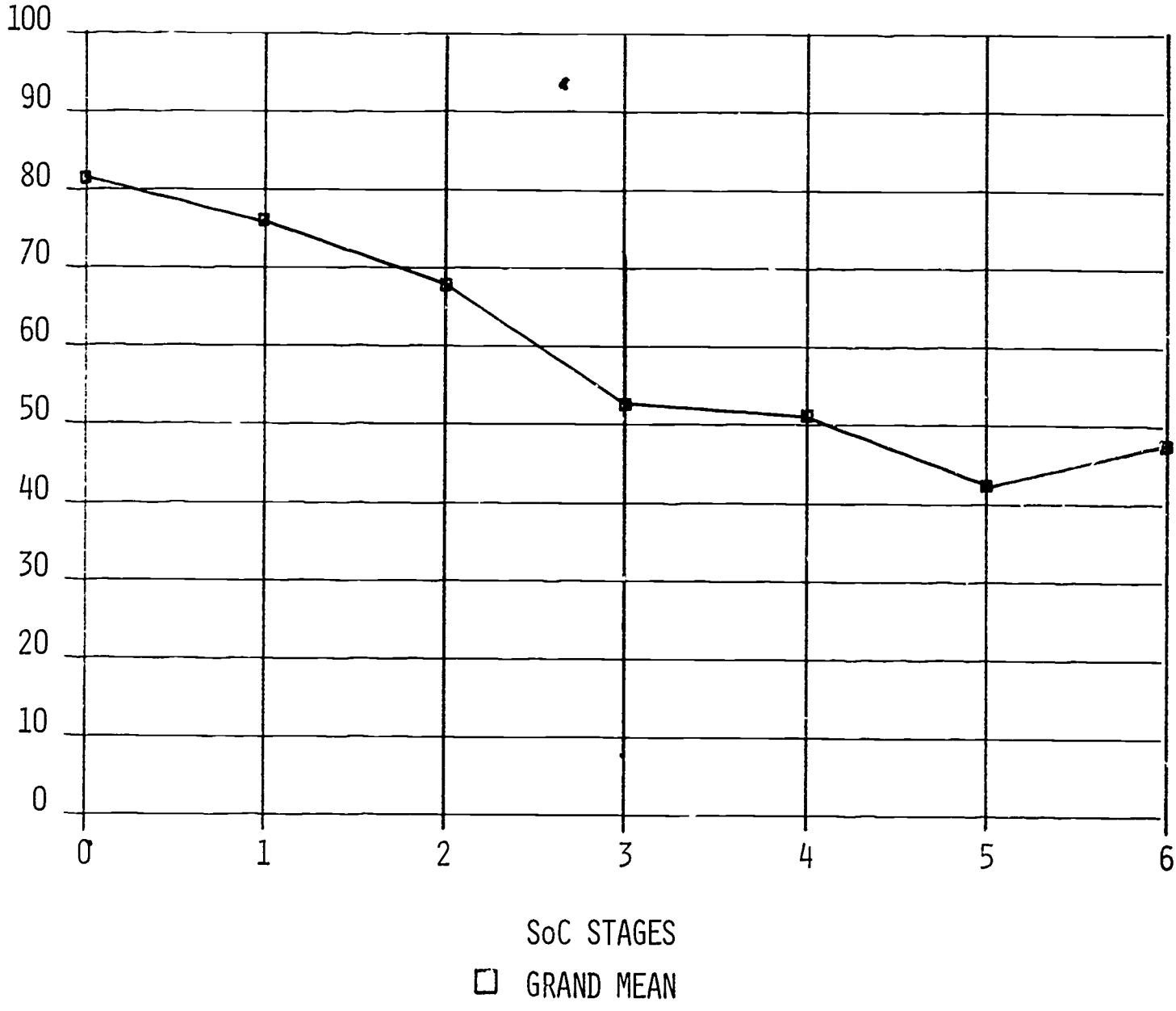

Figure 5

Critical Factors to Consider

"Do" Suggestions:

- Identify one person (position) to provide leadership
- Make at least limited resources available
- Develop a plan based upon discrepancy between desired state and current status
- Involve interested faculty in planning, implementation and working together
- Provide faculty inservice to increase knowledge and skills
- Provide convenient, relatively private access to computer hardware and software for faculty and administrators
- Work with central administration and others on purchase and maintenance of hardware and software
- Be flexible about logistical problems
- Begin monitoring faculty and student attitudes and performances early
- Delegate and assign responsibilities for selecting, evaluating, cataloguing, etc., of resources
- Secure support (including financial) from the Dean
- Seek outside funding
- Include computer components in other funding proposals
- Demonstrate, model, and provide support for faculty personal productivity uses of computers

"Don't" Suggestions:

- Don't be impatient with the rate of change
- Don't be impatient with individual faculty lack of acceptance
- Don't let inadequate resources be used as an excuse
- Don't wait until the "time is right," e.g., technological advances or lower prices