

ENGINEERING PROFESSORS' ATTITUDES TOWARDS
THE ADULT STUDENTS ENROLLED
IN AN ENGINEERING
CURRICULUM

By

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CHAPTER I

INTRODUCTION

A quiet revolution is taking place on college and university campuses across this country. It is a revolution that began several years ago, in the sixties and seventies, and has been building in intensity ever since. It is not a violent revolution (Apps 1981, p. 11).

Adults are returning to school changing what used to be the exclusive world of the recent high school graduate and by doing so they are responsible for this "quiet revolution." And unlike the post-World War II transitional phenomenon where millions of veterans joined the colleges in one big wave and left just about the same way, adults are "dropping in" in ever increasing numbers. Between Fall 1973 to Fall 1983 the number of adults 25 to 34 years old enrolled in college increased by 68.8 percent with the increase accelerating to 90.0 percent among adults 35 years old and over (U.S. Department of Education Center for Statistics, 1985-86). To be more specific, the number of students over 25 years old enrolled in higher education more than doubled in 13 years rising from an estimated 2.4 million in 1970 to 5.1 million in 1983. Approximately 24 percent of the total population of students in higher education in 1983 was composed of adults over 25 years old (National Center for Education Statistics, 1985).

The "dropping-in" of adult learners of age 25 and over in higher education is expected to continue to show a 13 percent total increase

between 1983 and 1993. In contrast, even though the enrollment of students under 25 years showed a 20 percent increase from 1970 to 1983, it is expected that a demographic reduction in the traditional college-age population will decrease their enrollment in the next ten years by 20 percent (National Center for Education Statistics, 1985).

The schools of engineering throughout the nation have already felt the impact of this demographic trend in their undergraduate engineering enrollment:

Overall full-time undergraduate enrollment in engineering began to drop in the fall of 1984 and continued to do so in 1985. The total 1985 undergraduate enrollment, 384,191 was almost 3 percent lower than the 1984 total. This trend is expected to continue in the 1986-87 academic year. For the first time in over a decade, it is likely that there will be a drop in the number of senior engineering students, and thus in the number of bachelor-level engineering degrees. To the extent that these trends are primarily a function of demographic influences, similar decreases in engineering enrollment could persist well into the 1990's (Ellis, 1986, p. 57).

The adult learner clientele represent a rich source of replenishment for the empty seats that the traditional college age students will leave during the next decade (Brodzinski, 1980). But which institutions, and more specifically, which disciplines will attract the returning adult learner may largely depend upon how the faculty and administrators understand the adult learner's needs, motivations, differences from the traditional college student, and the adjustments the institutions and faculty members are willing to make to meet these needs (Apps, 1980; Backus, 1984; Brodzinski, 1980; Rawlins and Davies, 1981; Steitz, 1985).

Furthermore, since reports among studies investigating the faculty attitudes toward adult students indicate that the faculty attitudes are dependent upon academic affiliation (Barnes, 1981; Brewster-Norman, 1981; Sisco, 1981; Skeinbrecker, 1980),

. . . adult educators need to assess the attitudes toward adult learners in their own settings and/or institutional contexts (Sisco, 1981, p. 2443A).

Statement of the Problem

The College of Engineering at Oklahoma State University lacks a faculty profile that indicates the attitudes of their teaching staff towards the adult learners in their classrooms.

Purpose of the Study

The purpose of this study was to develop a profile of engineering professors' attitudes towards the adult students enrolled in an engineering curricula.

Need for the Study

This study was prompted by the following:

1. In order to provide more effective education to adult students in a given academic curriculum, college administrators need to know teaching staff attitudes towards adult students in their institutions (Apps, 1981; Knapper and Cropley, 1985; Sisco, 1981).
2. The findings of this study will enable Oklahoma State University engineering college administrators to assess their faculty

readiness to teach adult students and to determine the need for adult educator preparation programs to enhance the professors' ability to function with adult learners.

Research Questions

In pursuing the purpose of this study answers were sought to these questions:

1. Are engineering professors aware of the presence of adult learners in the college population?
2. Do engineering professors recognize that adult learners have unique needs and characteristics that differentiate them from traditional college students; if so, what are the perceived differences between the adult learners and the traditional younger students in their readiness/orientation to learn?
3. Of the engineering professors that recognize the unique characteristics of adult learners, how were they alerted to the adult learner characteristics: by formal training (classroom instruction, seminars, workshops, etc.), by informal training (self-directed instruction, reading about it, etc.), actual exposure to the adult learner (teaching adults, direct observation of adults in learning environment, etc.), by direct participation (i.e. by being adult learners themselves in a structured environment), or other?
4. If engineering professors recognize the differences between traditional students and adult students, would they take these differences into consideration when teaching and evaluating the adult students?

5. Do engineering professors' expectations of their students differ in respect to academic performance between adult students and the traditional younger student?

6. What are the engineering professors' perceptions of the motives of adult students returning to school and enrolling in the schools of engineering?

7. Are there any differences in the responses of engineering professors on the awareness of the adult learners characteristics by number of years of teaching experience and completion of formal training in teaching methods/practices?

Scope of the Study

This study was limited to the faculty of the College of Engineering of Oklahoma State University teaching during the 1987 spring semester. Graduate teaching assistants, emeritus professors, and adjunct professors were excluded from the study.

Limitation of the Study

Given the nature of the study, the following limitation comes into play:

Since the study dealt with engineering professors at Oklahoma State University, its implications may not be applicable to other engineering professors at other universities.

Assumption

For the purpose of this study, the researcher made the following

assumption:

The attitudes expressed by the respondents were honest expressions of their perceptions of adult students characteristics and differences from the traditional students.

Definition of Terms

The following definitions, provided to clarify terms, are used throughout the study:

Adult - Wlodkoski's (1985) original definition was used:

First, a person is adult to the extent that that individual is performing social roles typically assigned by our culture to those it considers adults - the roles of worker, spouse, parent, responsible citizen, soldier, and the like. Second, a person is adult to the extent that the individual perceives herself or himself to be essentially responsible for her or his own life (p. 5).

Lifelong Learning - "A process of learning that continues throughout one's lifetime, depending on individual needs, interests, and learning skills" (Hiemstra, 1976, p. 16).

Returning Adult Student - An adult that has returned to school after a period of school interruption. This interruption is of a length that requires a readjustment period for the adult student. The terms returning adult, adult student and adult learner are used interchangeably (Apps, 1981; Barton, 1982).

Traditional College Student - A student enrolled in a collegiate level resident educational program, recently after his/her high school graduation. Such students have not assumed responsibilities

characteristic of adult status such as work, marriage or parenthood, and are not financially responsible for own upkeep (Apps, 1981; Barton, 1982). The terms traditional college student and traditional younger student are used interchangeably.

Organization of the Study

This study is organized in five chapters. Chapter I introduces the study, presents the problem that motivated the study, purpose of the study, need for the study, the research questions, scope and limitations, assumptions, and definitions pertinent to the study. Chapter II reviews literature related to the adult student and their impact on higher education. Chapter III reports the methodology followed in the study and Chapter IV presents the findings of the study. Finally, Chapter V summarizes the study and presents the conclusions derived from the study and recommendations for practice and for future research.

CHAPTER II

REVIEW OF LITERATURE

Increasing numbers of adults are infiltrating the colleges and universities of our country (Apps, 1981; Cross, 1980). These "new learners" represent a challenge for those involved in higher education (Gaff and Gaff, 1981). Faculty and administrators of higher education need to understand the external forces that are bringing these adult students back to the classroom and the students' motives for returning. Furthermore, since colleges and universities could benefit from the enrollment of these new learners, faculty and administrators need to understand the barriers that keep some of the potential learners from reaching the classroom, the adult learners characteristics, and how their own attitudes towards the adult learner can affect the success of the teaching-learning process (Apps, 1981, Cross, 1981).

The purpose of this chapter is to review literature related to the adult student and their impact on higher education. Since the engineering faculty was the target population of this study, implications for the schools of engineering were also explored.

The review was structured into five major areas:

1. Trends contributing to the return of adults as students and the implications for the school of engineering.
2. Barriers to adult participation in higher education.
3. Triggers to adult participation in higher education.

4. Characteristics of adults as learners.
5. Attitudes of the teaching staff towards adult learners and the teaching-learning process.

Trends Contributing to Return of Adults and Implications for Engineering Schools

As we enter the 1980s, the nation has accepted a pace of change that means the education and experiences we gain early in life are no longer adequate preparation for our our entire lives. We accept accelerating change and the need to adapt, recognizing learning's role in successful adaptation (Barton, 1982, p. 1).

Changes in the population, the rapid pace with which scientific information is being introduced, the changing role of women in society and the need for retraining as a result of occupational dislocation are all major forces contributing to the return of adults to school (Apps, 1981; Barton, 1982; Hiemstra, 1976).

"Adaptation to social and economic change triggers a learning connection (Barton, 1982, p. 11)." Institutions of higher education could take advantage of these changes by taking measures to make "the right connection" (Barton, 1982).

Changing Demographic Trends

Analyzing demographic trends is an important part of planning in American education, where knowledge of the size and age distribution of the population enables educators to prepare for the clientele to be served (National Center for Education Statistics, 1985, p. 77).

Increased life expectancy, declining birth rates, and the "baby boom" generation moving into the adult years, are among those factors

that have resulted in an increase of the number of adults in proportion to the total population. From 1970 to 1983, the number of adults aged 25 to 34 increased by 59 percent in contrast to an increase of 22 percent by the 18 to 24 year group (Figure 1). While this 18 to 24 year population group is expected to decrease an estimated 18 percent by 1993, the 25 to 34 year group is expected to increase 4 percent and the 35 to 44 year group 37 percent (National Center for Education Statistics, 1985).

The effect of the increase in the number of adults in proportion to the total population has been felt in higher education. As stated earlier, in 1983 adults 25 years old and over comprised 24 percent of the total amount of students in higher education. This trend is expected to continue in moderate steps. Predictions for the early 1990's state that the enrollment of adult students in higher education will somewhat compensate for the decline in the enrollment of the traditional college student population. Instead of an 18 percent drop in the total college enrollment, equivalent to the 18 percent decrease in the 18 to 24 year group population, it is expected that the total college enrollment will decrease only by 6 percent (National Center for Education Statistics, 1985).

Colleges of engineering also expect to be affected by such demographic trends. Ellis (1986) expressed engineering enrollment concerns by stating:

Since 1980 enrollment in all higher education programs has been affected by a steady drop in birth rates between 1961 and the mid 1970s. The impact of this demographic trend on engineering has been moderated by such counter-vailing factors as increased general interest in engineering careers and increase participation by women

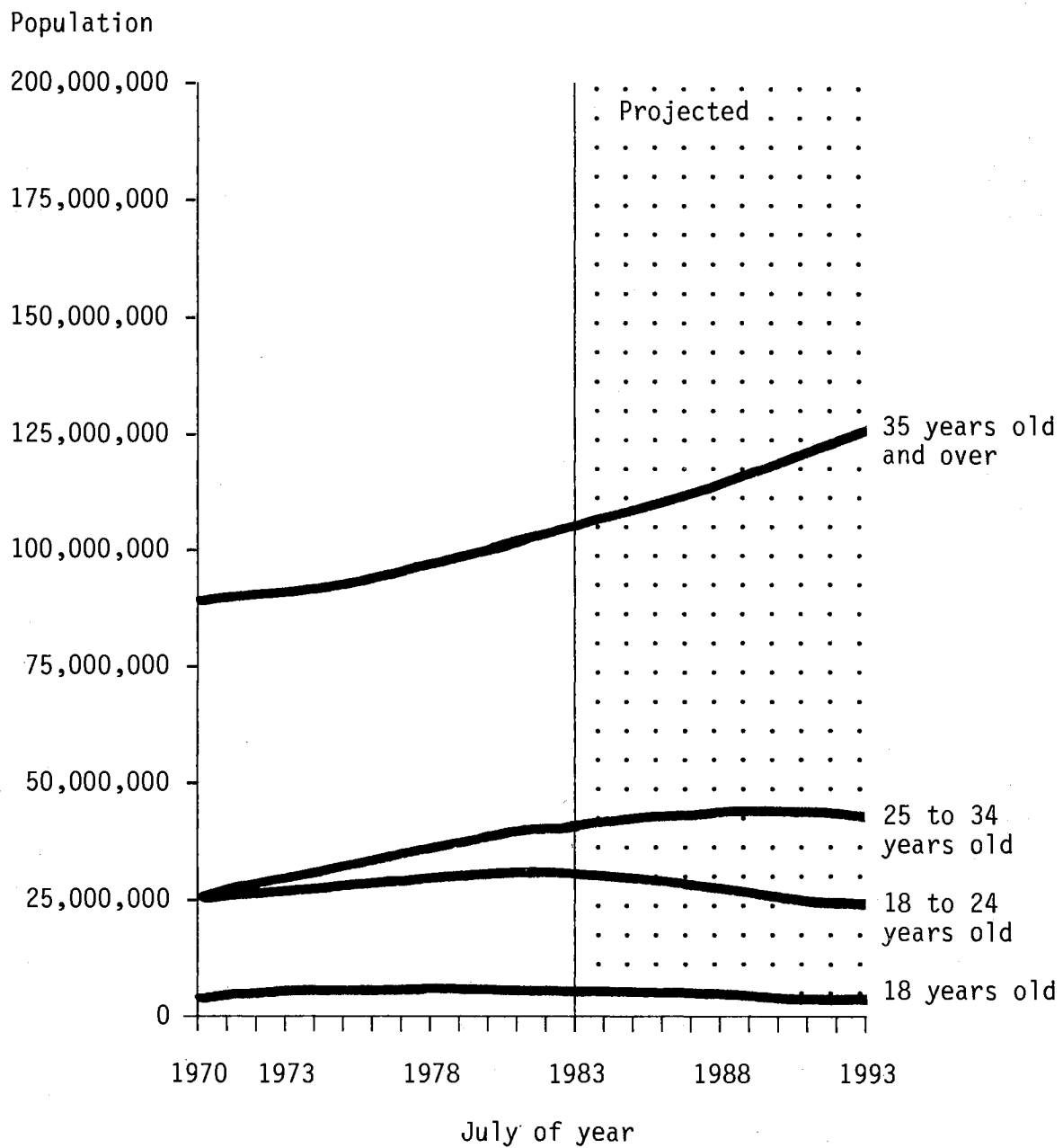


Figure 1. National Population Trends, by Age Group

Source: National Center for Education Statistics, 1985, p. 89.

and foreign nationals. Despite these offsetting factors, overall engineering enrollment could continue to decline for some time to come (p. 59).

Adult learners represent a potential source for engineering programs to offset potential decline in enrollments. Whether adult students are now or will be in the future one of the "countervailing factors" in the decrease of engineering enrollment, needs to be determined (Barton, 1982; Ellis, 1986).

The "Knowledge Explosion"

The absolute amount of knowledge is growing at a very high pace. According to Lukasiewicz (1971), the rate of growth of scientific information is doubling approximately every 15 years. In a person's productive lifetime of 45 years this represents an eight-fold increase. This "knowledge explosion" has a tremendous impact on our ability to keep abreast of developments in today's society (Apps, 1981; Cross, 1981; Kemper, 1982).

The impact of this "knowledge explosion" can be considered of critical nature for professionals in technical fields like engineering who could very rapidly fall into an obsolescence of professional competence (Cross, 1981; Hiemstra, 1976; Lukasiewicz, 1971; Seifert, 1964). Lukasiewicz (1971) defined the "potential obsolescence of an engineer as the number of new courses (not offered at the time of his graduation) relative to all courses offered at a given point in time" (p. 881). Based on this definition and assuming non-participation in learning programs, it would have taken a 1971 engineering graduate just 5 years

to become half as competent to do the job he or she was originally trained to do, compared to 12 years for a 1940 engineering graduate (Lukasiewicz, 1971).

To prevent becoming incompetent, professional engineers, like engineering faculty members, need to:

. . .try to keep abreast of: 1) progress in their specialties, 2) change in related specialties (new as well as existing), and 3) advances in the underlying knowledge base. They must also be able to anticipate the requirements of the future (American Society for Engineering Education, 1986, p. 19).

These requirements for continued professional development represent a challenge not just for the professionals to try to keep themselves competent, but also for the schools responsible for their education (American Society for Engineering Education, 1986; Lindsay, Morrison and Kelley, 1974).

Engineering schools have taken into consideration the "knowledge explosion" and have reacted basically by modernizing the curricula and by injecting more material into the courses (Griffith, 1981; Grogan, 1977; Lukasiewicz, 1971). Still much needs to be done in order to meet the needs of practicing professionals (Lukasiewicz, 1971).

The American Society for Engineering Education (1986) in their "Quality in Engineering Education Project" report emphasized the importance of continuing professional education as it applies to engineering faculty members:

. . .continuing professional development has become a critical problem for engineering technology faculty members, one that requires special attention and the dedication of significant resources (p. 20).

This concern needs to be expanded to cover the practicing engineers so that engineering professional schools play a major role in designing new programs to meet the needs of the practicing engineers. Practicing engineers represent a high number of potential participants of higher engineering education (Lukasiewicz, 1971; Seifert, 1964).

Changing Role of Women in Society

The Women's Liberation Movement, the Equal Employment Opportunity Act, the increase of women in the work force, and the increase of women in what used to be male jobs are all indications of the changing status of women in the American society (Barton, 1982; Cross, 1981; Darkenwald and Merriam, 1982; Knox, 1980). Much of this change in status can be attributed to the increased participation and achievements of women in education, particularly in higher education. Between Fall 1973 to Fall 1983 the number of women enrolled in college increased by 52.2 percent. In 1982, women accounted for more than half of the bachelor's degrees and master's degrees granted in the United States, compared to approximately 40 percent and 33 percent in 1962, respectively. Their advancements are more remarkable at the doctoral and first-professional degree levels. In 1982, women received three times the number of doctoral degrees and nine times the number of first-professional degrees received in 1962 (U.S. Department of Education Center for Statistics, 1985-86).

. . . In order to achieve this impressive growth record women have not only continued to major in substantial numbers of traditional fields like education, nursing, languages, and the arts, but they have also moved in everincreasing numbers

into fields like business, engineering, law, and medicine, which were once dominated by men (U. S. Department of Education Center for Statistics, 1985-86, p. 132).

In the field of engineering in 1985, women received 15 percent of all engineering degrees, composed 16 percent of the overall undergraduate engineering population, and 16.5 percent of the freshman group (Ellis, 1986).

Women were identified as one of the "countervailing factors" of the overall decline in engineering enrollment (Ellis, 1986). Even though no particular data seems to have been collected on the number of these women that were adults at the time, it is inferred that adult women will be one of the contributing factors of returning adults seeking increased education in engineering fields.

Occupational Dislocation

New technologies, fluctuations in the national economy, reduction in the number of jobs within a certain field, obsolescence of skills, relocation of industries, are among the factors forcing workers to change jobs and even "retool" in order to find a new job. According to Barton (1982) 36 percent of the adult working population was either in a work transition or anticipating one. Therefore,

. . .workers and managers will have to be more flexible to adapt their knowledge and skills to the rapidly changing requirements of technological innovation and international competition. The need for flexible adaptive human capital affects virtually every member of the adult work force and creates an unprecedented requirement for continual adult retraining (Perelman, 1984, p. 3).

While the need for retraining adults as a result of occupational dislocation has been identified by many writers, they also agree not enough has been done to solve the problem (Barton, 1982; Hiemstra, 1976; Swift, 1986; Lukasiewicz, 1971; Perelman, 1984; Knapper and Cropley, 1985; Choate, 1984). Choate (1984) summarized this position with the following words:

While the United States is doing much to modernize its stock of plant, equipment, and technology, it is doing too little to modernize its human capital. What the nation lacks, but desperately requires, is an integrated approach to renewing the skills of its adult work force through continual retraining and reeducation (p. xi).

Colleges and universities can play a major role in providing the learning environment and opportunities needed by this sector of the population in need of retraining and reeducation (Barton, 1982; Hiemstra, 1976). Engineering schools in particular could provide much of the retraining and education required due to the fast scientific and technological development (American Society for Engineering Education, 1986; Lukasiewicz, 1971).

Barriers to Adult Participation

The societal and technical changes that are bringing adults back into the classroom are overwhelming. The fact that higher education can benefit from the addition of adult students as active learners is beginning to gain acceptance. Yet many obstacles remain that are keeping adults from reaching the enrollment lines (Cross, 1981; Darkenwald and Merriam, 1982; Long, 1983; Nayman and Patten, 1980).

Numerous authorities present similar conceptual generalizations in regards to barriers to adult participation in education. Nyman and Patten (1980) categorized the prevalent barriers under three factors: psychological, developmental, and institutional. Cross (1981) used the categories dispositional, situational, and institutional, while Long (1983) used the terms personal, social and institutional. Darkenwald and Merriam (1982) used four categories: psychosocial, situational, institutional, and informational, adding the last category to the lists.

All four conceptual generalizations are very similar. Using Darkenwald and Merriam (1982) words to explain them:

Situational barriers relate to an individual's life context at a particular time, that is, the realities of one's social and physical environment. ...Institutional barriers, to use Cross's words, are those "erected by learning institutions or agencies that exclude or discourage certain group of learners because of such things as inconvenient schedules, full-time fees for part-time study, restrictive locations, and the like." ...The category of informational barrier is sometimes construed simply to mean institutional failure in communicating information on learning opportunities to adults, but the problem is more fundamental than this. It involves as well the failure of many adults, particularly the least educated and poorest, to seek out or use the information that is available. Finally, psychosocial barriers (sometimes referred to more narrowly as attitudinal or dispositional barriers) are individually held belief, values, attitudes or perceptions that inhibit participation in organized learning activities (p. 137).

The following list combines the above conceptual generalizations, and gives examples under each category, commonly identified in the literature as barriers to adult learners participation in higher education (Apps, 1981; Barton, 1982; Cross, 1981; Darkenwald and Merriam,

1982; Hiemstra, 1986; Hughes, 1983; Long, 1983; Sewall, 1984).

Psychosocial/Psychological Barriers

- Low self-confidence, poor self-image
- Stereotyped attitudes toward age or sex roles
- Fear of failure syndrome
- Unrealistic goals
- Lack of Interest

Situational Barriers

- Family responsibilities
- Work
- Role change conflict
- Adjustment to academic environment
- Time commitments
- Non-availability of funds
- Lack of child care
- Geographical isolation and lack of transportation
- Cost of courses

Institutional Barriers

- Inconvenient schedules
- Course load requirements
- Highly structured programs
- Financial aid policies
- Enrollment policies and procedures
- Lack of desired courses
- Time required to complete the courses

Informational Barriers

- Unawareness of educational opportunities
- Not knowing where to go to get information

Recognizing and understanding the obstacles to adult learners participation is a major step towards eliminating these barriers (Cross, 1981).

Research indicates that adult learners do want and need help in planning and utilizing learning activities that will help them to reach their goals. One of the greatest needs in a society with a rich variety of learning resources and a potential constituency of millions is to make the necessary connections between learners and resources. If that

"missing link" can be supplied, the learning society can become a reality (Cross, 1978, p. 43).

Triggers to Adult Participation

Adults are motivated to learn as they experience needs and interests that learning will satisfy (Knowles, 1978, p. 31).

Many adults have conquered the barriers that have impeded others from participating in educational programs. What made the difference? As stated by Darkenwald and Merriam (1982), the adults' reasons for continuing their education can be multiple, interrelated, closely connected to life roles, and highly personal.

Numerous census-type studies have investigated these reasons for participation and have associated these reasons for learning with life "transitions", and identified the specific reasons for participation as "triggers" (Long, 1983; Sewall, 1984). Long (1983) explained the logic behind these characterizations by stating:

Reduced to its bare elements, the logic is as follows:
(1) Transitions require learning, (2) identifiable events can be associated with the transitions, and (3) the events determine the times for learning (p. 99).

The specific reasons for participating in learning programs can be classified in major categories related to the trigger event and/or goal established. The most commonly identified reasons for learners participation, along with some examples, can be categorized as follows:

Career related goals

- to get a new job
- to advance in present career
- to get a certificate, license or degree
- to satisfy employer

Knowledge goals

- simply to learn
- to become better informed
- be better parent, spouse

Social/escape goals

- to make contact with other people
- to get away from daily routine
- to get away from problems or pressures

Religious/citizenship goals

- better able to serve church
- become a better citizen

(Apps, 1981; Cross, 1981; Darkenwald and Merriam, 1982; Hiemstra, 1986; Sewall, 1984).

While some researchers used census-type studies to determine reasons for adult learners participation, others used analytical motivation studies (Darkenwald and Merriam, 1982; Hiemstra, 1976; Long, 1983). Houle (1963), for example, tied the reasons for participation to "learning orientations": some people are goal-oriented, some are activity-oriented and some are learning-oriented. The goal-oriented has a specific objective in mind; the activity-oriented is primarily motivated by the activity itself rather than the subject matter; and the learning-oriented enjoys learning for the sake of learning.

Whatever the research method used, studies indicate that the reasons why adults engage in education are multidimensional. Usually one trigger has more weight than another, but it is seldom the sole reason (Apps, 1981; Cross, 1981; Darkenwald and Merriam, 1982).

Understanding the triggers to adult participation is part of the process in understanding the uniqueness of the adult learner (Hiemstra, 1976; Long, 1983).

Characteristics of Adults as Learners

Higher education can provide many people at all stages of the adult life-cycle with opportunities to grow, but growth is most likely if professionals in education understand adult development (Knox, 1980, p. 20).

Who are the adults returning back to school? How do they differ from the non-participants? Numerous studies in the field of adult education provide a basis to describe the adult learner on a comparison basis against the non-participant adult (Apps, 1981; Cross, 1980; Hiemstra, 1976; Long, 1983). According to these authorities, the adult learner when compared to the non-participant adult is likely to be:

- Younger
- White
- Better educated
- High salaried
- Employed
- Engaged in professional and technical work
- Urban resident
- Middle class

While such a profile can be very helpful for planners to decide what courses to offer and ways to reach potential adult learners, it is too broad for the faculty and administrators to understand the uniqueness of the adult learner (Richter-Antion, 1986). And as stated by Hiemstra (1976):

Understanding the uniqueness of the adult learner is a necessary requirement for the effectiveness with the teaching/learning process or in developing educational resources (p. 34).

Knowles (1978) in his andragogical theory of adult learning describes how adults differ from the younger individual. The very four assumptions upon which his andragogical model is based, help define the uniqueness of the adult learner:

1. Changes in self-concept - as a person matures his or her self-concept moves from one of total dependency to one of increasing self-directedness.

2. Role of experience - as an individual matures he or she accumulates an expanding reservoir of experience that becomes an increasingly rich resource for learning, and at the same time provides him or her with a broadening base to which to relate to new learnings. An adult's self-identity is based upon experiences.

3. Readiness to learn - adults readiness to learn is closely tied to the developmental tasks in their social roles as workers, spouses, parents, etc. Adults are ready to learn when, in order to cope with real life tasks and problems, they experience a need.

4. Orientation to learning - as individuals mature their orientation to learning changes from one of postponed application to one of immediacy of application. Thus adults come into the learning environment with a problem-centered orientation.

Apps (1981) when comparing adult learners with traditional students, lists the major areas of difference as:

(1) life experience - the returning students bring a wealth of experience to the classroom; (2) motivation - the returning students are highly motivated, with this motivation often related to a specific goal for attending college; (3) academic behavior - returning students often have problems adjusting to university life, including learning academic procedures, rusty study skills, inability to concentrate, and adjusting to problems associated with unlearning; and (4) other problems - unrealistic goals, poor self-image, social-familial problems, and sometimes an excessive practical orientation (p. 51).

Richter-Antion (1986) identifies six factors that distinguish adults from traditional age students:

1. The sense of purpose - adults come to school because they want to; they also have a clear purpose for attending.

2. The nature of financial commitment - adult students usually pay for their college education and demand their money's worth. Traditional students' financial obligations are usually taken care of by their parents.

3. The nature of time commitments - adults responsibilities and roles are many; for the most part academics is just one more responsibility along with work and family.

4. The difference in life experience - adults have lived longer than the traditional student therefore, their life experiences, to which they relate new learnings, are far more extensive than those of the younger students.

5. The lack of an age cohort - adults in a campus environment lack a reference group of peers. Unlike the younger students, adults are not part of an age cohort that deals with the same issues and problems.

6. The concept of social acceptability - adult students are defying the socially accepted timing for attending college. They are defying the established "social clocks". Traditional students on the other hand, are attending college at the proper time.

Knowles' (1978), Apps' (1981) and Richter-Antion's (1986) descriptions of adult learners and explanations on how they differ from the traditional college students can be very helpful to faculty and administrators dealing with adult learners. "The growing body of knowledge and research central to adult and continuing education is

replete with evidence of the adult's many unique characteristics, needs, and learning styles" (Hiemstra, 1976, p. 33).

Adult students are not necessarily better or worse than younger students, but they are different from younger students. These differences should be recognized and acknowledged by faculty and administrators in their dealings with adult students. (Richter-Antion, 1986, p.62)

Teaching Staff Attitudes and the Teaching-Learning Process

Universities can indeed be a part of the solution in the search for a future mode of continuing education. There are practical difficulties of process, but these can be overcome. The real barrier to success lies in pre-formed attitudes and unquestioned assumptions buried deeply in our backgrounds. The time has come to review them honestly. If we can, together, examine our own attitudes, how we formed them and how we can adapt them to better accommodate future needs in education, then the benefits can be enormous (Grogan, 1977, p. 752).

According to Rokeach (1972), "an attitude is a relatively enduring organization of belief around an object or situation predisposing one to respond in some preferential manner" (p.112). Attitudes are important since "... they are with us all the time and they constantly influence our behavior and learning" (Wlodkoski, 1985, p. 47). The attitudes of the teaching faculty towards the adult learner and the teaching-learning process are key factors to the success of the returning student (Apps, 1981; Kidd, 1959; Knapper and Cropley, 1985).

Apps (1981) includes "...belief about returning students and belief about teaching and learning as applied to adults" among the six instructor belief areas having "the greatest relevance for the learning

environment of returning students" (p. 69). As described by exemplary instructors of adult students, instructors should:

. . .accept returning students as adults, as people who have had a variety of experiences, as people who have held jobs, raised families, paid taxes, served on community boards, and worked with volunteer organizations (Apps, 1981, p. 73).

Instructors must believe that adults can learn, and that they have strong motives for returning to school; they must also be sensitive to the adults' needs and characteristics (Apps, 1981; Cross, 1981; Knox, 1977). Gaff and Gaff (1981) stress the importance of student-faculty relationships by stating:

. . .effective education requires that faculty members relate to students effectively as persons as well as teachers. Faculty need to acquire sensitivity to students, awareness of the complexities of their lives, tolerance for alternative views of knowledge and education, willingness to grow themselves by entering into new kinds of relationships, and ability to master new instructional styles and skills and to relate all to their more pragmatic and concrete goals (p. 654).

When it comes to the teaching-learning process and its relevance to adult education, numerous authorities agree that instructors need to get away from the "banking concept of education" (Apps, 1972; Apps, 1981; Cross, 1981; Kidd, 1959; Knowles, 1978; Hiemstra, 1976). This teaching concept sees educators as depositors of information into "empty" students who receive, memorize and repeat (Apps, 1972). Instead, an effective educator should be more of a facilitator, guider or helper than an authoritative source of knowledge (Apps, 1972; Cross, 1981; Kidd, 1959; Knowles, 1978).

As explained by Steitz (1985),

A professor's role for adult students needs to go beyond that of being a straight theoretician to that of also being a facilitator of practical applications of theory and cognitive guide (p. 16).

Now, is there a single recipe for becoming an effective adult instructor; is there a single method for effectively teaching adult students? Kidd in 1959 made the following statement:

No text or blueprint exists which sets out in any definite way all the arts or skills needed by the teacher, but many of the tools for his practice and study are available, if he will organize and use them (p. 303).

Recent literature in adult education is filled with concepts about educating the non-traditional adult student (Apps, 1981; Backus, 1984; Cross, 1981; Darkenwald and Merriam, 1982; Hiemstra, 1976; Knowles, 1978; Long, 1983; Wlodkowski, 1985). Learner-centered methods are among those mentioned more often as the most effective teaching-learning technique for adult students (Backus, 1984; Kowalski, 1984). However,

Only through using the findings related to the learning process in conjunction with an understanding of the unique qualities of adulthood can one begin to comprehend the nature of adult learning (Darkenwald and Merriam, 1982, p. 111).

The issue is not whether learner-centered methods should be applied universally by teachers of adults, but rather that teachers should be capable of choosing the appropriate methodology to suit the students and the situation. ...To do this the teacher must first understand the adult learner as well as a range of instructional modes (Kowalski, 1984, p. 10).

Beder and Darkenwald (1982) investigated the extent to which adults were perceived to differ from pre-adults on learning-related characteristics, and the extent to which teachers believed that students with different characteristics should be taught differently. Their studies verified that teachers do teach adults differently from the way they teach pre-adults and that these differences can be attributed, to a considerable extent, to the teachers' perceptions of learning-related differences. As explained by Beder and Darkenwald (1982):

Adults differ from pre-adults on psychosocial dimensions relevant to the teaching-learning transaction. Such differences would not, however, in themselves lead teachers to alter their behavior. For this to occur, teachers would actually have to perceive that there are differences between adults and pre-adults as learners. Further, they would have to believe that these differences should be taken into account when teaching (p. 143).

In order to serve the entire student population properly, college and university administrators need to assure that teaching faculty members are aware of the differences among learners of all ages (Backus, 1984; Gaff and Gaff, 1981; Kowalski, 1984). If negative attitudes towards the adult students exist among faculty members, they ought to be changed, since: "Erroneous attitudes can interfere with constructive and satisfying interpersonal relations" (Knox, 1977, p. 52). Luckily,

Attitudes are learned. They are acquired through processes such as experience, direct instruction, identification, and role behavior (teacher-student, parent-child, employer-employee, and so forth). Because they are learned, they can also be modified and changed (Wlodkowski, 1985, p. 46).

Summary

An increasing number of adults are returning back to school. Demographic changes, the scientific information explosion, the changing role of women in society and the need for retraining as a result of occupational dislocation are major external trends contributing to the return of adults to the classrooms. Yet barriers, that can be classified as psychosocial/psychological, situational, institutional and informational, stand in the way of many adults who otherwise could be militant students.

For those adults who have returned to school, their reasons for returning have been found to be multidimensional, with most of the reasons being attached to some kind of career-related, knowledge, social/escape, religious/citizenship goals, or a combination thereof.

Adult students differ from the traditional student. In this chapter Knowles' (1978), Apps' (1981) and Richter-Antion's (1986) descriptions of adult learners and how they differ from the traditional students were examined.

Finally, the importance of the attitudes of the teaching staff toward adult learners and its impact upon the teaching-learning process was looked into.

CHAPTER III

METHODOLOGY

This study was designed to develop a profile of engineering professors attitudes towards the adult students enrolled in an engineering curriculum. To obtain the information the following tasks were accomplished:

1. selection of the population;
2. development of the questionnaire;
3. collection of the data;
4. analysis of the data.

Selection of the Population

The population selected for this study consisted of faculty members within the College of Engineering at Oklahoma State University teaching during the 1987 spring semester, assigned to the schools of Chemical Engineering, Civil Engineering, Electrical and Computer Engineering, Industrial Engineering, and Mechanical and Aerospace Engineering, and designated as professors, associate or assistant professors. Permission for conducting the study was personally requested and granted from the Dean of Engineering, Architecture and Technology and the Heads of the different schools of engineering.

Seventy-two faculty members met the criteria and constituted the population for the study.

Development of the Questionnaire

The questionnaire was developed as an information-gathering tool, carefully considering the objectives of the study, the targeted population, and guidelines for preparation of data gathering instruments. The questionnaire was reviewed by two professors in the College of Education and two in the College of Engineering. Recommended changes in format, length and content were incorporated.

The final questionnaire (see Appendix) consisted of ten questions of which the first four probed the professors awareness of adult students in their classrooms and knowledge of differences from the traditional students. Questions five thru six dealt with whether or not professors would take the adult learners differences into account when teaching/evaluating them. Question seven asked for the professors expectations of the academic performance of the adult students when compared to the traditional students, and question eight asked for reasons believed why adults enrolled in the schools of engineering. The last two questions requested general information: number of years of teaching experience, and completion of formal training in teaching methods and practices.

Collection of the Data

The data collection took place at Oklahoma State University, during the last week of April 1987, at the professors' offices in the different schools of engineering. The researcher personally contacted each available professor to determine their willingness to participate

in the study. The researcher introduced herself, explained the purpose of the study, gave directions for completing the questionnaire, and remained available to answer questions and clarify points while the questionnaire was being completed. Respondents were also encouraged to share with the researcher any past experiences with adult learners in their classrooms. The questionnaire/interview sessions were designed to last from 5-30 minutes. The surveys were coded to indicate sex, which school of engineering the respondent belong to and his/her rank (professor, associate professor or assistant professor).

Professors' availability and willingness to participate in the study during the week the data was collected determined the size of the sample. The researcher attempted to personally contact each faculty member, present on campus, at least twice.

Analysis of Data

Descriptive statistics were used to describe and summarize the observations. The findings were structured according to the research questions stated in Chapter I. Frequencies and percentages were used to tabulate the data. Results were presented in table format.

CHAPTER IV

PRESENTATION OF FINDINGS

This chapter presents the findings of the study in the following order: (1) frequency of response (2) characteristics of the respondents, (3) awareness of adult students characteristics, (4) allowing for adult learner differences, (5) academic performance expectations, (6) reasons for enrollment in engineering, and (7) training in teaching methods and practices. The questionnaire in the Appendix was used to collect the data.

Frequency of Response

The study population consisted of 39 professors, 26 associate professors and 7 assistant professors for a total of 72 faculty members. The population structured by schools of engineering consisted of:

1. Chemical Engineering - 5 professors, 3 associate professors, and 2 assistant professors.
2. Civil Engineering - 8 professors, 9 associate professors, and 2 assistant professors.
3. Electrical and Computer Engineering - 9 professors, 6 associate professors and 1 assistant professor.
4. Industrial Engineering - 8 professors and 3 associate professors.

5. Mechanical and Aerospace Engineering: 9 professors, 5 associate professors and 2 assistant professors.

Due to availability, 64 percent of the total population completed the questionnaire/interview. (See Table I). Of the remaining 26 potential respondents, 7 were out of town during the period the questionnaire was administered, 16 were "not available" (i.e. they were in class, meetings, or not at the office any of the times they were approached), and 3 declined to participate in the study.

TABLE I
RESPONSE RATE TO THE QUESTIONNAIRE,
BY SCHOOLS OF ENGINEERING

School of Engineering	No. of Faculty Meeting Criteria	Number Responding	% Per School
Chemical	10	6	60
Civil	19	12	63
Electrical & Computer	16	12	75
Industrial	11	7	64
Mechanical and Aerospace	16	9	56
Total	72	46	64

N = 72

Characteristics of the Respondents

The number of respondents by rank and sex is presented in Table II. The two females (out of 3 in the total population) that participated in the study were both associate professors with one being a member of the Civil Engineering faculty and the other of the Mechanical and Aerospace Engineering faculty.

The number of years of total teaching experience is also shown in Table II. According to the results, the median number of years of engineering professors total teaching experience was 16 years, with 1.5 years and 39 years being the minimum and maximum number of years respectively.

Awareness of Adult Students' Characteristics

In response to research question one, "Are engineering professors aware of the presence of adult learners in the college population?", all respondents indicated an awareness of the presence of adult learners in their classes.

The second question in the questionnaire, "Do you believe adult learners have different characteristics from the traditional (18-21 years old) student that might affect their readiness and orientation to learn?" received a 98 percent positive response, answering the first part of research question 2. The data related to the second part of research question 2, if professors recognized that adult learners differ from the traditional students, what are the perceived differences in their readiness/orientation to learn,

TABLE II
FACULTY DEMOGRAPHIC
CHARACTERISTICS

Characteristic	Frequency	Percent
<u>Rank</u>		
Professor	24	52
Associate Professor	19	41
Assistant Professor	3	7
<u>Sex</u>		
Female	2	4
Male	44	96
<u>Teaching Experience (years)</u>		
1 - 5	7	15
6 - 10	12	26
11 - 15	4	9
16 - 20	9	20
21 - 25	8	17
26 - 30	4	9
31 - 35	1	2
36 - 40	1	2
N = 46		

are tabulated in Table III. The adult learner as being more serious, dedicated and motivated to his school work than the traditional student, was identified as an adult characteristic by 76 percent of the respondents. No other difference was identified by more than half of the respondents. Most professors (91 percent) were able to list at least two ways in which adult learners differ from the traditional students. These ways coincide with the literature written on adult learners characteristics and differences from the traditional students.

In comparing responses on the awareness of adult learners characteristics with the number of years of teaching experience, responses were very similar. Therefore, the data shows no difference in the responses of engineering professors on the awareness of adult learners' characteristics by number of years of teaching experience, giving a negative response to the first part of research question 7.

When asked how they became aware of the adult learner characteristics, the majority of the respondents (96 percent) identified actual exposure to the adult learner as the engendering activity. Only four percent had received formal training covering the characteristics of adult learners. Table IV tabulates this information, presenting the answer to research question 3, "Of the engineering professors that recognize the unique characteristics of adult learners, how were they alerted to the adult learner characteristics: by formal training (classroom instruction, seminars, workshops, etc.), by informal training (self-directed instruction, reading about it, etc.), actual exposure to the adult learner (teaching adults, direct observation of adults in learning environment, etc.), by direct participation (i.e. being adult learners themselves in a structured environment), or other?".

TABLE III
 PERCEIVED WAYS IN WHICH ADULT LEARNERS
 DIFFER FROM TRADITIONAL STUDENTS

Adults Perceived as:	Frequency* of Response
More serious/dedicated/motivated	35
Having more family/work responsibilities	16
Better time managers and better organized	15
Goal-oriented	13
More mature	11
Having rusty learning and rusty math skills	10
Having more relevant experience	9
Having problem-centered orientation	7
More inquisitive	3
Having slower response time	2
Wanting their money's worth	2
Feeling uncomfortable due to lack of peer group	1
Older	1
More patient	1
Producers of neat/complete work	1
Having better writing skills	1
Less interested in campus activities	1
Wanting to minimize time in school	1
Commuters	1
Total no. of responses	131

* Numbers may reflect more than one response per person.

TABLE IV
ACTIVITY ENGENDERING AWARENESS OF
ADULT LEARNERS' CHARACTERISTICS

Activity	Frequency*	Percent
Formal Training	2	4
Informal Training (reading, movie, etc.)	2	4
Actual Exposure (teaching/ observing adult learners)	44	96
Being an Adult Learner in a Structured Environment	16	35
Other	0	0

N = 46

* Number may reflect more than one response per person.

Allowing for Adult Learner Differences

In regard to allowances made for adult learner differences, (question 5) responses varied widely. (See Table V). When looked at in total, professors had negative inclinations toward evaluating the adult learner by a two to one margin, and approximately two-thirds felt negative about developing the curriculum differently for adult learners as compared to traditional students. Structuring assignments differently also received a majority of negative responses. Positive inclinations were expressed for the scheduling classes and teaching adult learners. Four professors, three in industrial engineering and

TABLE V
 ALLOWANCES FOR ADULT LEARNER DIFFERENCES,
 BY SCHOOLS OF ENGINEERING

Area	Schools of Engineering											
	Chemical		Civil		Electrical/ Computer		Industrial		Mechanical/ Aerospace		Total*	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Evaluating Adult Learners	0	6	6	6	5	6	1	6	2	6	14	30
Developing the Curriculum	1	5	4	8	3	7	2	5	1	7	11	32
Teaching Adult Learners	2	4	8	4	7	3	2	5	4	4	23	20
Scheduling Classes	3	3	9	3	8	2	3	4	4	4	27	16
Structuring Assignments	0	6	8	4	5	6	2	5	2	6	17	27
Other. (See text).	0	0	0	0	0	0	0	0	1	0	1	0

* Not all respondents answered all the questions and some respondents qualified their answers. (See text).

one in mechanical engineering, would shift their answers from negative to positive if their classes were composed of adults only. The one response under "other" stated that she would take the adult learner's experience into consideration when developing the curriculum if their experience was relevant to the class subject matter.

Table VI tabulates responses to question 6 and shows professors' willingness to accommodate specific variations when dealing with adult students. Again the answers, by schools of engineering, varied widely. When looked at as a total group, the data shows a predominantly negative disposition from the professors to remove time limits on tests, provide optional ways to meet course requirements, allow students to retest to improve grades or to do extra work to obtain a passing grade. Rescheduling tests and deadlines given weighted reasons received a majority of positive answers. Two different professors expressed undecided positions on each of two issues: removing time limits on tests and retesting to improve grades. Providing optional ways to meet course requirements and allowing students to do extra work to get passing grades elicited three and one undecided responses respectively. Three professors indicated they were not familiar with contract learning and the one responding under "other", stated that he would not handle any of the aspects differently for adult learners if not for others.

Analysis of the data presented on Tables V and VI combined lead to a negative answer to research question 4, "If engineering professors recognize the differences between traditional students and adult students, would they take these differences into consideration when teaching and evaluating the adult students?"

TABLE VI
WILLINGNESS TO ACCOMMODATE SPECIFIC VARIATIONS
WHEN DEALING WITH ADULT STUDENTS,
BY SCHOOLS OF ENGINEERING

Variation	Schools of Engineering											
	Chemical		Civil		Electrical/ Computer		Industrial		Mechanical/ Aerospace		Total*	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Rescheduling tests/deadlines given weighted reasons	5	1	8	4	8	4	4	3	6	3	31	15
Removing time limits on tests	1	5	2	10	0	10	2	5	0	8	5	38
Providing optional ways to meet course requirements	0	4	3	9	7	5	0	7	0	8	10	33
Retesting to improve grades	0	6	0	12	1	9	0	7	0	8	1	42
Allowing students to do extra work to get passing grade	0	6	1	11	4	7	1	6	2	7	8	37
Contract learning	3	2	2	5	9	1	2	3	3	6	19	17
Other. (See text)	0	0	0	0	0	0	1	0	1	0	2	0

* Not all respondents answered all the questions and some respondents qualified their answers. (See text).

Academic Performance Expectations

A near two-thirds of engineering professors (63 percent) reported in question 7 they expect the adult students to perform better academically than the traditional students, while all of the others stated they anticipate similar overall performance. (See Table VII). Based on these data, research question 5, "Do engineering professors' expectations of their students differ in respect to academic performance between adult students and the traditional younger student?" receives a positive response.

TABLE VII

ENGINEERING PROFESSORS' EXPECTATIONS OF ADULT STUDENTS'
ACADEMIC PERFORMANCE WHEN COMPARED TO
TRADITIONAL STUDENTS

	Frequency	Percent
Better	29	63
Worse	0	0
About the Same	17	37

N = 46

Reasons for Enrollment in Engineering

Question 8 on the questionnaire was designed to obtain an answer to research question 6 on professors' views as to why adult students enroll in the engineering curriculum. These data are shown in Table VIII. It was found that professors perceived 14 different motives; no single reason was cited by a majority of the respondents.

Training in Teaching Methods/Practices

Responses to question 9, "Have you ever completed formal training in teaching methods and practices during or prior to your teaching experience?" are shown in Table IX. Over three-fourths of engineering professors surveyed (78 percent) had never completed formal training in teaching methods and practices. In only one instance did a majority of professors completed such a training.

In comparing responses to question 9 and question 3, the response patterns were very much alike, showing no difference between those having formal training in teaching methods/practices as compared with those lacking such training. Therefore, the second part of research question 7 receives a negative response.

Other Data

During the collection of the data, several respondents shared with the researcher concerns, problems and reasons why they answered a given question in a particular way. This additional information is discussed in this section.

TABLE VIII
 PERCEIVED REASONS WHY ADULT STUDENTS ENROLL
 IN SCHOOLS OF ENGINEERING

Reason	Frequency of Response*
Financial security (improve earning ability, higher salaries)	19
Better job opportunities	14
Interest in the Engineering Profession	11
Occupational dislocation	9
Career advancement	8
Matching school with skills & technical backgrounds	5
Meet changing job requirements	5
Continuing education (advanced degrees)	4
Seeking better working conditions, more satisfying work	4
Increase in knowledge	2
Challenging	2
Prestige	2
Meet needs of society	1
Availability of educational funds	1
Total no. of responses	90

* Numbers may reflect more than one response per person.

TABLE IX
 COMPLETION OF FORMAL TRAINING IN
 TEACHING METHODS/PRACTICES,
 BY SCHOOLS OF ENGINEERING

School of Engineering	Yes	No	% (Yes) Per School
Chemical	4	2	67
Civil	1	11	8
Electrical & Computer	0	12	0
Industrial	3	4	43
Mechanical & Aerospace	2	7	22
Total	10	36	22

More than one respondent identified lack of classroom facilities and personnel as limitations to eliminating time restrictions on tests. In addition, as stated by one of the industrial engineering professors, "...the fact that some students confuse time constraints with not understanding the test question or not knowing the material required to answer the test, complicates the matter." Limited resources, i.e. classrooms and personnel, were also identified as obstacles to rescheduling classes to meet the adult learner needs.

Concerns on the fairness or impartiality of practices such as allowing students to do extra work to get passing grade, or retesting to improve grades, were expressed by several of the respondents. One

professor, when comparing adult learners' versus traditional students' academic abilities, described adult's performance on written tests below the traditional students' performance, but when comparing performance on classroom projects, he found adults' performance takes the lead.

An engineering professor addressed the small number of adult students in engineering as a limiting factor, not warranting changes in the curriculum, evaluating procedures or scheduling of courses. He admitted that his teaching methods and practices are primarily determined by the majority of his student audience, and since adults compose only 1 to 2 percent of his students, he sees no need for special accommodations.

Summary

A response rate of 64 percent was obtained for this study. The majority of the engineering professors that participated were male professors with a median number of years of teaching experience of 16 years. All professors acknowledged being aware of the presence of adult learners in their classrooms, and all but one recognized adult students as having different characteristics from the traditional students.

The leading characteristic identified perceived as the way in which adult students differ from the traditional students was that the adult learner is more serious, dedicated and motivated to his school work. Engineering professors' awareness of the adult learners characteristics primarily came about by actual exposure to the adult learner himself.

In their inclinations and willingness to allow for adult learners differences, professors' responses, by school of engineering, followed

a random pattern. However, negative inclinations were expressed towards evaluating the adult learner; developing the curriculum or structuring assignments differently for adult learners than for traditional students. Removing time limits on tests, providing optional ways to meet course requirements, allowing students to retest or to do extra work to obtain a passing grade were also viewed negatively. Positive inclinations were expressed for scheduling classes, teaching adult learners differently, and rescheduling tests and deadlines given weighted reasons.

It was also found that: the majority of the respondents expect the adult student to perform better academically than the traditional student; hoping to improve earning ability and obtain higher salaries upon degree completion was the predominant perceived reason why adult learners enroll in schools of engineering; and that only a minority of engineering professors (22 percent) had completed formal training in teaching methods and practices.

Limited institutional resources, like classrooms and personnel, were addressed by several professors as obstacles to eliminate time restrictions on tests and rescheduling courses to meet adult learners' needs. The fairness or impartiality of such methods like, allowing students to retest or do extra work to obtain a passing grade, was questioned by several of the respondents. Finally, the fact that adult students are a small number of engineering students when compared to the traditional student was identified by an engineering professor as too small of a population to warrant changes in the curriculum, evaluating procedures or scheduling of courses.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter summarizes the study, discusses the results of the study, and makes recommendations for practice and research.

Summary

The purpose of this study was to develop a faculty profile of the College of Engineering at Oklahoma State University that indicates professors' attitudes towards the adult learners in their classrooms. This study would then enable engineering college administrators to: (1) assess their faculty readiness to teach adult students, and (2) determine the need for adult educator preparation programs to enhance professors' ability to function with adult learners.

The population for the study consisted of faculty members within the College of Engineering at Oklahoma State University teaching during the 1987 spring semester. Of the 72 faculty members targeted by the study, 46 completed the questionnaire/interview. The instrument was designed to obtain information on: (1) respondents characteristics, (2) professors' awareness of adult students characteristics, and (3) professors' willingness to allow for adult learner differences.

Data collected were analyzed using descriptive statistics. The major findings were:

1. All professors were aware of the presence of adult learners

in their classes.

2. Ninety-eight percent of the professors recognized adult students as having different characteristics from the traditional students, and 91 percent were able to list at least two ways in which adult learners differ from the traditional students. These ways coincide with the differences listed in the review of literature.

3. Primary awareness of adult learner differences came about by actual exposure to the adult learner.

4. Professors, as a group, generally believed no special allowances should be made for adult learners in terms of:

- a. evaluating the adult learner;
- b. developing the curriculum;
- c. structuring assignments;
- d. removing time limits on tests;
- e. providing optional way to meet course requirements;
- f. allowing students to retest; and
- g. allowing students to do extra work to obtain a passing

grade;

5. As a total group, professors expressed primarily positive inclinations towards taking adult learner needs into consideration when:

- a. scheduling classes;
- b. teaching; and
- c. rescheduling tests and deadlines given weighted reasons.

6. The majority of the professors expected their adult students to perform better academically than the traditional student.

7. The majority of the professors had never completed formal training in teaching methods and practices.

8. Limited number of classrooms and personnel were identified as barriers that preclude practices like eliminating time restrictions on tests and rescheduling classes to meet the adult learners' needs.

9. The fairness or impartiality of practices such as allowing students to do additional course work to pass the course, or to retest was challenged by several respondents.

Conclusions

The following conclusions are drawn from the findings of this study and are applicable only to engineering professors at Oklahoma State University.

1. Differences between adult students and traditional students have had little influence on altering engineering professors' classroom practices.

2. Even though engineering professors are aware of the differences between adult learners and traditional students, they do not believe, as a group, these differences should be taken into account when teaching and evaluating the adult learner.

3. While engineering professors recognize adult learners differ from the traditional students, they as a group, don't understand how those differences affect the teaching-learning process.

4. The quality of instruction in the schools of engineering could be improved if engineering professors were better prepared in the area of teaching-learning process and methodology and how this process

is affected as the human being matures, ages, and assumes different roles and responsibilities.

Recommendations for Practice

Based on the findings of this study, recommendations for practice are:

1. To provide institutional workshops for faculty members in adult education teaching methods and practice to enhance the professors' ability to function with adult learners in an adult/traditional students environment.
2. To provide workshops for faculty members on the characteristics of adult learners and how these characteristics affect the teaching-learning process.
3. That professors in engineering complete formal training in teaching methods and practices prior to teaching.

Recommendations for Research

The findings of this study suggest the need for further studies to:

1. Determine ways for stimulating college engineering professors to participate in educational programs covering learning processes, teaching methods, educational evaluation and how to adapt them depending on the student and the situation.
2. Determine traditional and adult engineering students level of satisfaction with engineering professors' teaching abilities.
3. Determine engineering professors' teaching practices, evaluation techniques, and knowledge of learning theories.

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QUESTIONNAIRE

WHEN ANSWERING THESE QUESTIONS PLEASE KEEP THE FOLLOWING DEFINITION IN MIND:

ADULT LEARNER = A mature person who has assumed responsibilities characteristic of adult status such as work, marriage, or parenthood, and is financially responsible for his/her upkeep.

1. Are you aware of adult learners in your classes? ___ Yes ___ No
2. Do you believe adult learners have different characteristics from the traditional (18-21 year-old) student that might affect their readiness and orientation to learn?
___ Yes ___ No
- (If your answer is No go to question 6).
3. Identify ways in which adult learners differ from the traditional student in their readiness/orientation to learn:
- a. _____
b. _____
c. _____
d. _____
4. How did you become aware of the adult learner characteristics?
- a. Through formal training. _____
b. Through informal training (reading, movie, etc.) _____
c. Actual exposure (teaching/observing adult learners) _____
d. Being an adult learner in a structured environment. _____
e. Other. Please specify: _____
5. Do you believe these differences should be taken into account when:
- | | | |
|-------------------------------|-------|-------|
| | YES | NO |
| a. evaluating adult learners? | _____ | _____ |
| b. developing the curriculum? | _____ | _____ |
| c. teaching adult learners? | _____ | _____ |
| d. scheduling classes? | _____ | _____ |
| e. structuring assignments? | _____ | _____ |
| f. Other. Please specify: | _____ | _____ |
6. Would you consider the following treatment warranted when dealing with adult students?
- | | | |
|--|-------|----------|
| | AGREE | DISAGREE |
| a. Rescheduling test/deadlines given weighted reasons. | _____ | _____ |
| b. Removing time limits on tests. | _____ | _____ |
| c. Providing optional way to meet course requirements. | _____ | _____ |
| d. Retesting to improve grades. | _____ | _____ |
| e. Allowing student to do extra work to get passing grade. | _____ | _____ |
| f. Contract Learning | _____ | _____ |
| g. Other. Please specify: | _____ | _____ |
7. How would you expect adult students to perform academically when compared to the traditional students?
___ Better ___ Worse ___ About the Same
8. List two reasons you believe adult students have for coming into the engineering curricula.
- a. _____
b. _____
9. Have you ever completed formal training in teaching methods and practices during or prior to your teaching experience?
___ Yes ___ No
10. How many years of total teaching experience do you have? (Include university teaching, military teaching, college teaching). _____

VITA 2

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Candidate for the Degree of

Master of Science

Thesis: ENGINEERING PROFESSORS' ATTITUDES TOWARDS THE ADULT STUDENTS
ENROLLED IN AN ENGINEERING CURRICULUM

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