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A descriptive study of attitudes and behavior toward professional continuing education by distance means within five professional groups in Marquette County, Michigan

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Michigan State University, 1992

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A DESCRIPTIVE STUDY OF ATTITUDES AND BEHAVIOR TOWARD PROFESSIONAL CONTINUING EDUCATION BY DISTANCE MEANS WITHIN FIVE PROFESSIONAL GROUPS IN MARQUETTE COUNTY, MICHIGAN

By

Anthony Thomas Grudnoski

A DISSERTATION

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ABSTRACT

A DESCRIPTIVE STUDY OF ATTITUDES AND BEHAVIOR TOWARD PROFESSIONAL CONTINUING EDUCATION BY DISTANCE MEANS WITHIN FIVE PROFESSIONAL GROUPS IN MARQUETTE COUNTY, MICHIGAN

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The attitudes and behaviors of professionals (engineers, lawyers, physicians, K-12 teachers, and professors) in the Marquette County, Michigan, area toward professional continuing education by distance education means were the subject of this descriptive study.

The probability that these professionals would engage in distance education programs during the next year, should such programs become available in their fields of endeavor, was also treated.

Using a stratified random sample of the populations as a sample group, the author conducted telephone interviews of one hundred respondents to gather data about past and current professional continuing education practices, and current attitudes toward participation in distance education for the delivery of courses and information.

The interview schedule was pretested with selected working professionals in the groups to be studied, and a pilot study of 25 randomly selected members of the five professions was conducted to further refine the interview schedule.

Data are reported in crossbreaks, tables, and charts in which the responses from the populations are presented in a clear graphic fashion.

The major findings of the study are that the majority of the sample populations were predisposed toward involvement in continuing education and to a lesser degree to distance education methods. The mean length of professional employment among those in the sample was twenty years.

To Dad, who saw me through, and
To my brother David who went ahead

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STATEMENT OF THE PROBLEM

Introduction

Universities, colleges, state government and private businesses are spending millions of dollars to provide the hardware for distance education. In Marquette County, Michigan, professional engineers, lawyers, physicians, professors and teachers will have a number of distance education avenues available to them for participating in professional continuing education. Though the technical devices are available to provide distance links for

education, can we be sure the population is ready to use them? How can we know if there is a need for all the technology?

Specifically, with respect to five communities of professionals that make up the sizable potential market for distance education, there appears to have been little research examining the practicing professional's participation in or desire to participate in distance education as a means of professional continuing education in the United States. The majority of research about professional continuing education that does exist is confined primarily to medical fields.

The Problem

In the population of engineers, lawyers, physicians, professors and teachers in Marquette County, Michigan, is there a demand for professional continuing education that can be met by distance education technology? The researcher set out to describe present attitudes and behaviors toward distance delivery of professional continuing education to this population in this limited geographic area.

The Purpose

The purpose of the research was to investigate the behavior and attitudes of the members of five professional groups (engineers, lawyers, physicians, professors and

teachers) in Marquette County, Michigan, toward professional continuing education via distance education means. Interviews were conducted with a randomly selected sample of the members of the five professional populations. The various groups, their similar geographic location and expected different behaviors and attitudes toward professional continuing education by distance means were observed. One goal was to determine which circumstances appeared to be more closely related to involvement in professional continuing education by distance means in contrast to involvement in professional continuing education by traditional campus based means.

An outcome of the study was a baseline measurement of attitudes twpard and interests in distance education as a means of delivery for professional continuing education among professionals who have the financial ability to support distance education delivery systems and technology. The study subsumes importance from the expenditure of nearly $500,000 in public funds through State of Michigan grants to the Upper Great Lakes Educational Television, Incorporated (UGLETI) for distance education studies and technologies.

The study was limited geographically to the isolated, yet technology rich, Marquette County, Michigan area, and is limited in scope to the five professional populations studied: engineers, lawyers, physicians, professors and K-12 teachers. Comparisons are provided, for the first time, of

the attitudes and behaviors of representatives of the five professions toward distance means of professional continuing education.

The Rationale

Marquette County, as a center for the professions in Michigan's Upper Peninsula, provides a rich mix of employment levels and specialties. Engineers work in a variety of ways: in private practice, in major iron and gold mining operations, and in government posts. Lawyers practice in probate, circuit and state and federal district courts. Physicians practice both independently and in a regional medical center with the largest medical community within 200 miles; professors and instructors teach at Northern Michigan University, a state funded school located in Marquette. Teachers work for private and public K-12 schools.

Historically, in Michigan and the nation, professional education programs are built around a campus based core curriculum with supervised practice and skill demonstration playing a major part in completion of the professional program.

Based upon the five populations selected for the study and the known incongruities in their settings one might well anticipate findings of great variation. Members of both the physician and teacher populations must, under law, continue education for relicensing. Teachers may select Northern

Michigan University, in Marquette, within 30 miles of home for their studies. Doctors may select hospital provided training at Marquette General Hospital in Marquette or Bell Memorial Hospital in Ishpeming. Marquette county physicians are about 400 miles from any medical school campus where post graduate courses are available.

Engineers and lawyers have been under no legislative dictate to gain post graduate training or education. Engineers, should they choose to pursue postgraduate training, have Michigan Technological University about 100 miles away. Lawyers have no law school campus within 400 miles. Professors, depending upon specialty, have varying long distances to travel for additional studies.

The rich diversity of professional continuing education offerings through distance education means available to professionals in Marquette County, Michigan, by virtue of the current efforts of technology specialists and educators is significant. Most of the target population is served by one cable television company which offers programming on "The Learning Channel" and programs from "The Mind Extension University" among its thirty-seven channels. Projects such as the Hospital Satellite Network and the Michigan Instructional Television Network (MITN) as well as Public Broadcasting System (PBS) special links and videoconferences are also available to the professionals. Video tape programs from the University of Arizona's "Extended Campus" for

scientists and engineers and Texas Information and Instruction Network for teachers, as well as computer links via a statewide network (MichNet) to universities, are becoming more common.

A number of studies about distance education detail reasons for participation; however, in these investigations those studied were mainly uneducated, non-readers and non-high school graduates who are learning basic skills--not with professionals. Professional continuing education studies of professionals have examined and illustrated attitudes and reasons for participation in professional continuing education in campus based and seminar settings which are primarily group meetings. In most instances the data revealed the social benefits of on campus studies.

The question is raised: Do findings from these studies of other groups hold true for engineers, lawyers, physicians, professors and teachers in the Marquette County, Michigan, area?

From earlier studies, Grotelueschen (1979) and others developed a scale (Participation Reasons Scale) to assess the reasons for participation in professional continuing education. The scale has been used with judges, physicians and marketing and finance executives. (Catlin 1982; Cervero & Anderson 1981).

The rationale presented by Grotelueschen (1979) for the instrument is based on three assumptions: (1.) that participation of professionals in continuing education activities is purposive; (2.) that there are some outcomes which can be effectively achieved through participation in professional continuing education and; (3.) that there are items which would suggest educational implications.

In another study the stages of development in the professional's career were examined. The importance of the relationship between the professional's age and career stage and educational participation were indicated. (Rizzuto 1983).

In her study of women working in health care in a large acute care hospital in a metropolitan setting, Rizzuto uses two scales developed by Angrist and Almquist (1975). These were combined into one instrument: The Survey of Working Women's Educational Activity.

Rizzuto concludes that the study "...has shown that significant differences in women's participation in education and the factors influencing it can be found in subgroups of women such as those women employed in various occupations within the health care field, and those of various marital statuses...that a variety of personal and environmental factors influence working women's participation in education."

Rizzuto indicates that there must be further study of the influence of environmental factors on continuing education, of the practices of women in other industries, and of the effect of mandatory continuing education which is not shown to be of significant influence in her study. The findings "...indicate that a majority of these women are committed to their careers and continue to invest their time and money in work related education" (Rizzuto 1983).

Bacon (1988) studied professional continuing education among Lutheran ministers in the midwest. He reports using a scale similar to that which Grotelueschen developed in establishing these reasons for continuing education among those ministers in his sample: professional improvement and development, professional service, professionalism, collegial learning and interaction, professional commitment and reflection, and personal benefits and security. The same elements appear in the lists of Bacon and Grotelueschen, though in a somewhat different order of importance.

These theories and studies helped focus the current investigation into behaviors and attitudes of members of five professional groups toward professional continuing education by distance means. It was not thought that study of the professional practitioners in the five groups might well show a decided relationship between the locus of campus professional continuing education availability and negative

attitude or behavior toward distance education. Conversely, it was thought that such a study might illustrate that factors other than proximity of campus programs affects behaviors and attitudes of members of the five professions.

The Significance of the Study

Whether professionals in these five groups, and by extrapolation people in other groups, will use distance means of professional continuing education is both an educational and a financial question. These professionals have money to spend to gain the expertise they desire and are willing to buy information and training.

One object of the study is weighing the desire for professional continuing education and the impact of distance professional continuing education on those who want training. By comparing the desire for training with the available professional continuing education attitude research, some direction or measure of the desire by professionals for professional continuing education and the needs to provide it for these five professions may become apparent. There have been no quantifiable data available in this area until now.

The study adds to the theoretical foundation of the field in extending the professional continuing education research specifically into the aspect of distance education application. It establishes a baseline measure of attitudes and behavior extant within the five professional groups.

The results of the study can be used to structure professional continuing education offerings by both universities and schools and the private independent purveyor. Validation or confirmation of the reasons for participation in professional continuing education and professional continuing education by distance means as reported by Bacon and others for these five specific professional groups can be measured.

The Limitations of the Research

The five groups in the study are in the Marquette County, Michigan, geographical area and there may have been unexpected or unknown controlling variables in addition to those variables considered. It is believed, however, that the ability of the professional to pay, the richness of distance education avenues available in the area, the divergent populations selected and the variety of campus based Professional Continuing Education opportunities coupled with the differing legislative requirements for

continuing education for the populations provides a framework of variables that are readily observable and statistically meaningful.

Definitions

Distance education is defined as education where, "the person or institutions that provide instruction are separate, either in place or time, or both from their learners" (Moore 1989 8). "The term distance education is used interchangeably with the terms 'open learning' and 'extended-degree program' because these terms all represent greater opportunities for learning through flexible adjustments in the time schedule for physical location of classes (Mitzel, Best & Rabinowitz Eds. 1982).

Professional continuing education is defined as learning activities in which practicing professionals participate for various reasons. "...most professions now embrace the importance of lifelong professional education." A new field of educational practice increasingly differentiated from pre professional practice (Cervero 1988 3).

Engineer: for the purposes of this study the engineer is defined as any person with a degree in an area of engineering; civil, mechanical, chemical, mining, or other.

Lawyer: for the purposes of this study the lawyer is defined as any person with a degree in law who is a member of the Michigan Bar and who is engaged in legal practice.

Physician: for the purposes of this study the physician is defined as any person with a degree in medicine who is engaged in the practice of diagnosis and treatment of disease.

Professor: for the purposes of this study the professor is defined as any person who instructs full-time at Northern Michigan University or its ancillary units.

K-12 Teacher: for the purposes of this study the teacher is defined as any person with a degree in education and current teaching certification who is engaged in instruction in a public or private K-12 school.

Overview of the Study

Chapter I is a presentation of background information such as the problem area, purpose of the study, limitations and scope of the study.

Chapter II is divided into parts which present related literature and research about distance education, continuing professional education, the field of adult education and construction of the study.

Chapter III contains a description of the procedures followed in selecting the population sample, the investigative instrument and procedures. The procedures surrounding the pretest and pilot study and the processes of conducting the investigation are reviewed.

Chapter IV is an examination and explanation of the response data and graphically displays comparisons of sample behavior and attitude responses.

Chapter V includes a summary of the findings, conclusions, reflections and recommendations for further study.

CHAPTER II

REVIEW OF THE LITERATURE

The Introduction

The review of literature is divided into four spheres: distance education means for delivery of instructior in various settings; adult and continuing education; studies of involvement behaviors and attitudes toward professional continuing education in the five professions of engineer, lawyer, physician, K- 12 teacher and professor; and research study construction and development, interview construction, research study implementation, and small group statistics.

In the first sphere, the examination of studies of continuing education instruction delivered by distance means is considered. The concept of distance education dates from the 1880s when a Swedish teacher of bookkeeping, Hause Hermod, continued to coach students by mailing lessons to those who had left his town. The first attempts at

telecommunications-based distance education began in 1953 after the Federal Communications Commission reserved 242 channels for noncommercial broadcasting of educational television (Acerri 1988 1).

Distance Education

Distance education is a current 'catch-all' phrase for any form of instruction in which the learner is linked to an educational institution and is formally enrolled, but instruction does not necessarily have to be delivered to or from an official school site. Distance education can provide equity and increase the quality of educational opportunity; it can also provide access to subject matter not available in the local community, interaction and joint activities ... increased access to information/instructional resources ... and inservice training (Batey & Cowell 1986).

A number of studies of the learning that takes place under distance education and comparisons to classroom learning of similar concepts have shown that there is no measurable difference in student achievement. Most studies have been done at the high school and college undergraduate level. Only a few studies of distance education use with adult education have been reported. The reason, according to Michael Beaudoin:

> Much prejudice still exists against academic programs that do not conform to the curriculum for full-time 'day' students. Most faculty members are products of a conventional classroom-based education, and many have little tolerance for non-traditional approaches. Even when external degree programs are tolerated, they often function as separate and unequal entities, set apart from the mainstream of the parent institution's administrative and academic enterprises. (1986).

A survey of about 8,000 students who were enrolled in 42 different college-credit telecourses in the spring of 1984 identified four major differences in the background of the students and the manner in which they tended to view the programs. The findings include:

(1) Compared to on-campus students, telecourse students were more likely to be women, to have dependents at home, and to be employed;
(2) Significant age differences were noted. Professional development courses especially were attracting older pupils.
(3) Sixty-eight percent of the students were women, 44 percent were over 29 years of age, and 81 percent were employed.
(4) More than half used telecourses because of schedules, 85 percent viewed at home (Brey & Grigsby 1984).

By 1989 writers in education-related magazines were asking why the great promise of distance education or distance learning had not materialized. Jason Ohler, director of the Educational Technology Program at the University of Alaska, calls it a failure of people to develop a view of the future. Until we realize a "paradigm shift" that will allow us to see beyond our life span, he says, we will make little progress because we dwell on the past rather than look to the future. Ohler likens the origins of distance education to the beginning of the industrial revolution's first steam engine installations in factories. Now, 200 years later, we see what the steam engine has done to our roles (Bruder 1989).

By 1988 Business Week had noted the future was bright for the professional who wanted to continue school but could not leave work. Citing programs that allow students via computer and television to work on degrees and courses that provide needed information in specialized fields, the article notes that "time shifting" is becoming viable because of the proliferation of video tape recorders and home computers (Ivey 1988).

Also noting the scheduling problems professionals have was John Carter who wrote:

> Perhaps the most commonly recognized reason why persons select distance learning programs relates to their desire for an educational opportunity not available from conventional sources or not pursuable because of time and space constraints (4).
>
> Many students pursue distance education programs in order to acquire skills needed for career advancement and development without interrupting an existing profession. (Carter 1982 4)

Much of what is known and believed about distance education comes from the operation of The Open University (OU) in Great Britain. Researcher Robin Mason of the OU Institute of Educational Technology said, in personal correspondence with the author of the current study in 1990, that the OU does not use television in an interactive mode but that computer conferencing is used in the interactive mode.

The three original media - broadcast television, radio, and printed text - were not chosen by accident for the British Open University's system when it was established in 1969. Virtually every home in Britain could receive materials by one of these media. Technology is today providing audio and video recordings as alternatives that are no longer too costly for students, and micro computers, too, are becoming lower in price. "The new media and equipment are giving students greater control over their learning and greater interaction" (Bates 1984 6).

The International Council for Correspondence Education has found few comparative studies of the quality of independent study courses and on-campus courses. For those reviewed at the University of Saskatchewan, a model course design was constructed and applied to evaluate three studies. The resultant conclusions drawn are (1) independent study courses incorporating the model design compare favorably with on-campus courses in terms of student achievement and student satisfaction; (2) sample results are not related to the quality of instruction or to difficulty in coping with course content, but to competing demands for time (family and job demands, illness, moves, death and births); (3) there is a tremendous variation among learners in terms of personal characteristics. (Earl Misanchuk cited in Daniel, Stroud and Thompson 1982
38-39)

Since the early 1970s emphasis has been placed on individualized instruction. "Theoretically there is an almost unlimited hardware capability--provided the need is believed great enough, the number to be reached large enough, and hence the cost reasonable enough. The practical limitations on hardware are in the desire for it, the worth of the content to use with it, and the willingness to pay the cost involved. The willingness, of course, is related to other needs and the priorities" (Armsey & Dahl 1973 14).

The problem then becomes one of software: the substance, content, or style of delivery of the program for the user. It is no longer acceptable to take the available hardware, usually developed for some other purpose, and attempt to adapt it to an instructional purpose. The Open University in Great Britain is a world leader in the application of software and structure to distance education.

The OU first used their "CoSy" system, which it purchased from the University of Guelph, Ontario, in 1986, for the course: "An Introduction to Information Technology: Social and Technological Issues" in 1988.

The largest portion of the course, as with all major Open University courses, consisted of print materials. The print materials were enhanced by audio and broadcast media in delivery of these courses. In addition to those media, the addition of "CoSy" required all students to have an IBM-compatible micro computer "to gain practical experience

of the social and technological issues discussed in the written material." This practical portion of the course comprised 20 percent of the work (Mason 1988 1).

Final registration of 1364 students included 1006 males and 358 females. Approximately 100-150 students had dropped the course by the time of the report. About half of the remaining students were between 30 and 40 years old, the other half ranged from 21 to 'over 66.'

The educational and occupational backgrounds of the students were biased toward the technical, clerical and managerial fields. The number of students from the caring professions, medical and social services, and housewives was considerably lower than the standard for this type of OU course (Mason 1988 4).

In May, at the halfway point of the course (from March through July 1988), 118 students of the 1364 enrolled had not logged on to CoSy; 486 students had been logged on for more than five hours; 728 students read but did not contribute to the class forum; 364 students left one or more messages on the system. Mason estimates that about 100 cases are in missing data caused by equipment failure. An additional number of students numbering between 100 and 150 dropped the course. Sixty five percent of the students felt confident about using the system while only 45 percent felt comfortable with it (Mason 1988).

Mary Alice White wrote, in The Future of Electronic Learning (1983), that she sees "electronic learning" developing in three stages:

> Stage One is the television state, emerging in the 1940's.
> State Two is the computer stage.
> Stage Three will be the electronic environment for information, for work, and for entertainment (51).

Education at all levels in the United States has moved through Stage One, into Stage Two, and on toward Stage Three. Since 1983, when the personal computer was being introduced by IBM with a price of $2500 to $4000 for an "XT" class machine, we have seen competition drive the cost of an "XT" class machine down to the $400 to $500 price range, making them much more widely affordable.

In White's Stage One, television is seen as the source of autonomous learning. This medium is an informal and entertaining way to learn; as an autonomous alternative to formal schooling, it de-monopolizes school as the center for formal learning and teaching (White 1983 54).

At Stage Two, White sees the student working at a micro-computer; alone, attendant and interested for long periods of time. Whether this happens in centers or at home is of little consequence (55).

Stage Three implies a goal-directed behavior: information processing with accessibility and controllability allowing more questions and more diversity for the individual (56-57).

Is technology really available at home for the student who may want to use it?

A national study by the Corporation for Public Broadcasting and the Center for Statistics into the educational uses of telecommunications and information technology or electronic media was conducted in 1985. The Home Information Technology Study (Riccobono 1986) set out to "determine what people consider important enough to learn on their own, with an emphasis on what is involved in such 'informal' learning and why particular learning aids (including, but not limited to telecommunication technology) are chosen or preferred over others" (i).

Using a relatively rigid protocol for selection which involved computers and screening of telephone numbers, the survey team sampled 1,650 adults from a population estimated at 164 million potential adult participants.

Four types of educational media were of interest in the study: print, audio, video and computers. Print was considered universally available. Virtually all American homes were found to include at least one television set and one radio among standard household furnishings. About half the households indicated receiving basic or pay cable

television services. (It was estimated that three-fourths of U. S. households had access to such services in 1985. Currently in Marquette County, Michigan, over nine-tenths of the population has such access.)

Twenty-nine percent of all adult household members had a videocassette recorder/player available. One fourth of the wealthy and about three percent of all adults in U. S. households with incomes under $10,000 indicated the availability of personal computers.

About four out of five adults in computer-owning households indicated the availability of some kind of educational software. Over 80 percent of adults had both record players/stereos and audiocassette players available. Books and magazines were the most frequently used learning resources with almost four of five learners having used such materials.

TABLE 1 illustrates the percent of employment of information technologies employed by adults in their most important learning activity. One will note that the "low tech" print materials score highest.

Also shown is that in 1985 adults used print materials in more than 80 per cent of learning, more for practical and intellectual pursuits than for recreational pursuits. The columns represent the total percentages and, in parentheses, the actual numbers responding. Columns two and three indicate the use of the media for recreational and for

practical learning. By reading across the columns one can see the comparisons between media use for recreational and practical learning and both types related to the totals. For example, books and magazines are used by a 81 percent of the total learning, 74 percent as choice of preference for recreational reading, 86 percent for practical learning. Books and magazines are used more often for practical learning than the overall average, and for recreation less often.

When learning style preferences were introduced as variables, the distribution of use of media for learning activity appeared even across learning styles with only small variations observed in the data in TABLE 2. The attitudes toward learning resources of various types are depicted in TABLE 3.

Computers are somewhat more likely to be used in learning by persons who prefer individual to group learning and by those who prefer to set their own learning pace (TABLE 2). Those expressing individualistic learning styles are somewhat more likely than those preferring group learning to use books and magazines. Riccobono reports no significant differences emerged with regard to the use of video and audio resources (Riccobono 1986 14).

TABLE 1 Percentage of Adults employing various Information Technologies/Resources in their most important Learning Activity by Type of Learning

Type of Technologies Resource Used	Total	Type of Learning: Recreational	Type of Learning: Practical/ Intellectual
Books/Magazines	81% (1519)	74% (592)	86% (927)
TV Programs	41% (1519)	33% (592)	46% (927)
Videocassettes	17% (448)	10% (169)	21% (279)
Records	12% (1321)	10% (527)	14% (794)
Radio Programs	20% (1519)	12% (592)	26% (927)
Audiocassettes	15% (1263)	10% (505)	19% (758)
Computers	26% (205)	12% (505)	32% (145)

Analysis restricted to sample members in households with appropriate technology available who reported some learning during the past year.
NOTE: Numbers in parentheses represent number of sample cases. Numbers outside parentheses indicate percentages. (Data from: Riccobono 1986).

As TABLE 3 illustrates, adults demonstrated a more positive attitude toward the familiar print materials than toward what was then about a three year-old computer technology. Clearly, adults show a preference for those technologies with which they have become comfortable and familiar.

TABLE 3 also shows that more than four out of five adults, and about 9 of every 10 teens, were aware of books and magazines that could have been helpful in their most important learning activity. The attitudes of the respondents, no matter which resources they used or did not use, were assessed regarding the utility or potential utility of available resources.

Video cassettes, records, radio programs, audiocassettes, and computer programs were perceived as "not helpful" by more than half of all respondents.

As might well be anticipated, proportionately more persons who had actually used a particular type of resource in their most important learning activity rated that resource more helpful for learning than those who had not used that type of resource. Videocassettes and radio programs were exceptions to this general finding in that, regardless of user group, they were perceived as "not helpful." Among users of more than one type of media who had used print media, books and magazines were seen more helpful than other media resources.

TABLE 2
Percentage of Adults Employing Various Information Technologies/Resources in Their Most Important Learning Activity By Learning Style Preferences

Type of Technology/ Resource Used	Total	Prefer Individual to Group Learning		Prefer People Over Books as Information Source		Prefer Setting Learning Pace to Having Pace Set By Others	
		Agree	Disagree	Agree	Disagree	Agree	Disagree
Books/Magazines	81% (1481)	77% (731)	85% (753)	75% (679)	87% (773)	82% (1212)	76% (276)
TV Programs	41 (1481)	39 (731)	41 (753)	39 (679)	42 (773)	41 (1212)	40 (276)
Videocassettes	17 (442)	19 (209)	14 (233)	17 (208)	17 (226)	17 (363)	15 (82)
Records	12 (1294)	10 (634)	13 (660)	10 (584)	12 (686)	11 (1060)	14 (239)
Radio Programs	20 (1482)	18 (731)	21 (751)	20 (677)	19 (733)	19 (1212)	23 (274)
Audiocassettes	16 (1238)	12 (592)	18 (646)	14 (553)	16 (660)	15 (1001)	15 (239)
Computer Games/ Programs	26 (200)	33 (106)	20 (94)	30 (82)	24 (119)	27 (168)	21 (35)

Analyses restricted to sample members in households with appropriate technology available who reported some learning during the past year.
NOTE: Numbers in parentheses represent number of sample cases.

TABLE 3
Attitudes Toward Learning Resources
By Type and Mix of Technology Used: 18 Year Olds and Older

Perceived Helpfulness of Learning Resources	Total	Type of Technology/Resource Used: No Print or Technology	Print Only	Print and Video	Print Audio and Video
Books/Magazines					
Very Helpful	62%	15%	68%	77%	73%
Somewhat Helpful	28	40	26	21	24
Not Helpful	10	45	6	2	3
TV Programs on a Regular Channel					
Very Helpful	23	6	14	37	39
Somewhat Helpful	33	21	24	47	41
Note Helpful	44	73	62	16	20
TV Programs on a Cable Channel					
Very Helpful	20	8	12	27	33
Somewhat Helpful	25	20	21	33	28
Not Helpful	55	72	67	40	39
Videocassettes					
Very Helpful	15	3	8	22	30
Somewhat Helpful	22	21	20	19	22
Not Helpful	63	76	72	59	48

TABLE 3--Continued

Perceived Helpfulness of Learning Resources	Total	Type of Technology/Resource Used: No Print or Technology	Print Only	Print and Video	Print Audio and Video
Records					
Very Helpful	11	3	4	5	27
Somewhat Helpful	20	16	13	16	30
Not Helpful	69	81	83	79	43
Radio Programs					
Very Helpful	12	1	3	5	34
Somewhat Helpful	23	15	13	23	41
Not Helpful	65	84	84	72	25
Audiocassettes					
Very Helpful	14	1	4	6	35
Somewhat Helpful	21	17	14	22	25
Not Helpful	65	82	82	72	40
Computer Games or Programs					
Very Helpful	13	3	6	7	11
Somewhat Helpful	15	13	12	10	18
Not Helpful	72	84	82	83	71
Number of Sample Cases	1180	200	450	251	279

Analyses based on all sample members reporting some learning during the past year. Categories are mutually exclusive but not exhaustive (i.e., other resource combinations also exist); therefore, sample cases for individual categories will not sum to total.

Michigan State University and the city of Rockford, Illinois developed a teaching unit for firefighters which employed two-way television. The 1974 project explored the teaching format as well as technology (Baldwin et al. 1978). and indicates these specific research results: Two way, interactive television, where respondents have individual response capability and personal feedback, is more favorably assessed than one-way television and is considered equal to live instruction by the participants; and the cost of two-way television, in most circumstances, is lower than autotutorial or lecture methods of instruction.

The Rand Corporation studied the use of interactive television to educate day-care directors and caregivers of Spartanburg, South Carolina. The project, also in 1974, involved GED course study with telephones and computers.

California State University and Colleges developed a five year plan in 1979 to connect campuses with telecommunications. The 19 campuses would be interconnected with two-way video, telephone, data and facsimile exchange. These projects were the forerunners of today's technology.

Internationally, at the beginning of the 1980's the potential of distance education was a seeming oxymoron as it was seen to have the special potential for large-scale education as well as for individualized learning (Holmberg 1981).

These characteristics make distance-study facilities attractive to people who cannot or do not want to attend classes regularly and to people who have limited time to spend on study, such as most adults who have jobs, families and various social commitments. These people can rarely allow themselves, or financially afford, to go to campus for full-time study. Setting aside 10 to 15 hours a week for study is usually the most that can realistically be expected. Professionally active adults constitute the great majority of distance students. Historical evidence makes it fairly safe to assume that distance education in the form of correspondence study was created to give those who could not go to an ordinary school or university a chance to study. Distance education was, and is, a means of providing adult education, based on a belief in the value of education for its own sake and also for professional promotion and for improving social status (Holmberg 1981 39).

Holmberg sees distance study as a formal education innovation with five relevant characteristics:

> The underlying ideas that learning can occur without the presence of a teacher and that the support given to students can be adapted to their standards of knowledge (instead of insisting on formal entrance qualifications).
>
> The consistent use of non-contiguous media both for the presentation of learning matter and for the ensuing communication.
>
> The methods used to exploit the non-contiguous teaching/learning situation so as to attain the highest possible effectiveness for the individual learner: structure and style of presentation and communication (didactic conversation), appropriate use of media available, adaptation to students' conditions of life, etc.
>
> The particular organization which makes it possible to provide for both independent individual learning and mass education through personal tutoring and industrialized working methods.
>
> The influence distance education exerts on adult education, further training and labor-market conditions, by opening new study opportunities as well as through its methods and organization (Holmberg 1981 125-126).

Though distance study students participate when their circumstances allow, there are four important requirements congruent with the circumstances:

> i. non-contiguous feedback to tell students if and to what extent they have mastered the elements of knowledge and/or proficiency presented in a course unit;
> ii. free pacing to allow students to work when their circumstances permit independently of any plans of their university or school;
> iii. opportunities to sit for examinations when they are ready to do so; and
> iv. a credit-point organization that allows and encourages them gradually to acquire competence in one subject or part of a subject after another (Holmberg 1981 126).

Feasley (1983), in a Carnagie Commission research study, reports findings similar to those of Holmberg's. Julian (1982) also shows similar study results. Thus, three research efforts in the early '80s all found similar results with different programs and populations.

One of the more interesting educational phenomena of the 1960's was the way in which the "technology" business burgeoned, skyrocketed, and subsequently plummeted. Once again the hardware drove the system. Today, educators are hesitant to spend more money on costly hardware because the pace of change has been so rapid that costly equipment is obsolete in five years or less.

Is distance education an example of technological drive? The annals of education are replete with stories of technology-driven educational design. Developing technologies and changing needs require constant planning and shifting of delivery systems. One example of the use of technology was the Midwest Program for Airborne Television Instruction scheme in the midwest which coupled television transmission's line-of-sight limitations with airplane flight to provide a wide area for reception of signals in schools in several states. The program was found too expensive to continue, though it did illustrate the efficacy of coordinated television instruction.

A vivid example of failure was the Learn Alaska Network which failed because there were not enough people in the intended audience to justify the creation and programming of a sophisticated television-based distribution system. If either of these programs were initiated today, satellite communication and television cable transmission would be the logical delivery systems.

Adult and Continuing Education

The second sphere to be examined is the general field of study of adult education and the reasons students give for participation. This field has generated literature suggesting that much learning is purposeful, goal oriented and learner controlled (Houle 1961).

By focusing on continuing professional education, the researcher examines one aspect of educational participation by adults. In doing so, the study provides insight into the ways adults engage in "... systematic and sustained learning activities for the purpose of bringing about changes in knowledge, attitudes, values, or skills" (Darkenwald & Merriam 1982, 9). This is not, however, a phenomenon limited to professional persons but involves adults throughout the varied strata of this society.

A substantial number of research studies have identified why adults participate in general continuing education activities; a number of consistent motivational themes have generated instruments to measure participation and its correlates (Boshier 1971; Houle 1961).

Houle studied 23 groups before concluding that Professional Continuing Education is different from Adult education in general and, therefore, that a separate body of knowledge, inquiry, research and practice must be developed (Houle 1961).

The reason adults participate in continuing education has been assumed to be the result of an individual's psychological orientation toward such activities (Adolph & Whaley 1967). Seaman and Schroeder (1970) were the first to incorporate "attitudes" as part of an adult education participatory model. Using an attitudinal framework composed of cognitive, affective and behavioral components, they suggested that the inner relationship of attitudes affects participation. Individual behavior toward an objective such as participation was, they felt, attributable to the relationship of the attitudinal components and the immediate situation. In their view, attitudes were the

variables that aroused situational clues. These clues were linked to personal characteristics and were determinants of behavior.

A test of the Seaman and Schroeder's model demonstrated a significant positive relationship between attitudes and the extent of participation. However, when Seaman and Schroeder factored out age and educational level from the research, the relationship was questioned. They concluded (Seaman & Schroeder 1970 105): "there are factors, presumably situational in nature, other than those explicitly considered in this study, that do affect the influence which attitudes have on the extent of educative behavior...." As far as they were concerned, this supported the assumption that both situational and attitudinal variables were preventing respondents from participating more often in educative behavior.

Grotelueschen and Caulley (1977) assumed that an individual's attitude toward continuing education represented only one dispositional component of behavior. They applied the conceptual framework of Fishbein (1963 1967) in their research. According to Fishbein (Scanlan 1986 5), "attitudes are instrumental in predisposing a set of intentions toward behavior associated with an object." An individual's behavior toward participation ultimately represented the overt intention(s) of the individual.

Along with the Fishbein framework, Grotelueschen and Caulley used an expectancy-value function to assess the quality of various reasons for participation in continuing education. They identified three constructs that were antecedents to participation: (1) the attitude of the individual toward participation; (2) the perception which others have of his behavior; and (3) the individual's personal expectations of himself.

Grotelueschen and Caulley quantified attitudes toward participation as being dependent upon what professionals believed relative to the outcomes of participating and the value professionals placed upon those outcomes. A professional's intention to participate resulted from interactions among attitudes, perceptions and values of expectations by significant others, and personal beliefs about whether one should participate. These were linked with one's own motivation to comply with those beliefs.

Critics of this model (Ray 1979; Southern 1980) cite the lack of research by Grotelueschen and Caulley into other factors influencing participation. They faulted the model for its failure to explain the relationship to reasons for participation and the presence of sociodemographic variables that influence participation.

Groteluesch en (1985) attempted to answer this criticism when he included a measure for these other variables in his research.

The survey method was used by Groteluesch en and Cervero to research motives for participation and to identify independent sociodemographic variables. The in-depth interview was used by Houle to formulate an answer to the question "why are learners active in continuing learning" (Groteluesch en 1961 13). A typology of three learner participation orientations for continuing education resulted from Houle's research: goal-oriented, activity-oriented, and learning-oriented. The typology was expanded by other researchers. Cross wrote (1981 84):

> (1.) Almost every learner has more than one reason for engaging in learning. (2.) Adult learners are more frequently motivated by their pragmatic desire to use or apply the knowledge or skill. (3.) Learning patterns for adults may begin with: (a.) Awareness that that they want to do something or are assigned a task by others that requires new learning. (b.) Puzzlement or curiosity about controversial issues or issues important to the life of the learner. (4.) Most participants enjoy learning which plays an important role in the continuation of learning projects as the learner seeks to satisfy his desire to be informed.

Houle's typology was researched by Burgess, who collected data from 1,046 adults engaged in 54 different learning activities. Respondents indicated on a

five-point scale how influential each of seventy reasons was in determining their participation. Seven clusters of reasons were indicated (Burgess 1971 18-25):

> (1.) The desire to know. (2.) The desire to reach a personal goal. (3.) The desire to reach a social goal. (4). The desire to reach a religious goal. (5). The desire to take part in social activity. (6). The desire to escape. (7.) The desire to comply with formal requirements.

Burgess then calculated the orientation of each of the 1,046 respondents. He found (1971 134) that 325 respondents had a single dominant orientation (to know, 66; personal goal, 54; social goal, 54; religious goal 42; social activity, 3; escape, 33; and formal requirements, 38); that another 592 had two or more dominant orientations; and that the orientations of 129 could not be classified.

Cross summarized the findings of participation surveys (Cross 1981 91-92):

> 1. The reasons people give for learning correspond to their life situation: i.e., people with jobs want better jobs and are interested in further education to get them. Interest in job-related goals for continuing education begins to decline at age 50 and drops off sharply after age 60. 2. Typically one-third of the potential learners cite "personal satisfaction" as one of their reasons for learning. 3. A low of ten percent to a high of 39 per cent of the potential learners who respond to such surveys identify "to seek knowledge for its own sake as their primary motivation." The majority of adult learners do not regard traditional, discipline-based subjects as satisfactory for participation in continuing education. 4. Various studies have found eight per cent to 28 per cent of the learners interested in obtaining degrees or certificates for their participation. Younger learners with college

backgrounds are most likely to be degree-oriented. Most studies, however, show about two-thirds of the respondents on surveys want some kind of recognition for their learning. 5. Over one-third of the respondents on surveys admit "escape" is one reason for pursuing education, but rarely offer it as the primary motivation for participation. Respondents who cite "escape" as a motive see continuing education as an opportunity for meeting new friends, are likely to be interested in hobbies/recreational subjects, and are people who lack other social outlets. 6. "The desire to learn to be a better citizen" is not a strong reason for learning. About a quarter of the respondents name it as one reason among others. This observation varies with the social situation; i.e., a surge in demand for energy courses in the last decade has waned in the present decade.

The Cross and Zusman (1977) review of over thirty surveys on participation in continuing education stated (Cross 1981 93): "These general conclusions about which groups of people are motivated by which reasons seem to hold across studies and over the years for which we have data--not much more than a decade or so." Cross identified the weaknesses of the time-bound association survey as being the lack of and the reliability of information beyond a single point in time. The findings of surveys taken in the early 1970's, prior to recognition by our society of the critical need for lifelong learning, differed with surveys being done in the 1980's because the underlying assumptions differed. The review of the participation surveys using general

population samples found that they were descriptive surveys, generally time-bound, and showed a wide range of reasons for participation in continuing education.

Surveys of the general population's reasons for participation in continuing education have resulted in the identification of three to nine clusters of orientations. While these are helpful for making generalizations about the general population of adults, the clusters are limited in their usefulness in identifying the unique participatory reasons of professionals. Research studies of the general population's demographic variables proved useful in predicting participation. While useful for predicting participation by the general population, they are inadequate as a predictor for participation by professionals.

Hesburgh, Miller and Wharton, writing for a Task Force examining Patterns for Lifelong Learning (1973) which included Houle, Miller, Varner and Wharton, nearly ten years earlier than Rice, cautioned:

> American educators should start moving toward a conciliation and articulation of core education and continuing education. On one side, we have a formal academic system that we support with public and private funds. On the other side is an informal structure that has grown up around the school and the campus, responding to people's needs for continuing education. Since schools and colleges can do only so much, and since lifelong learning is important, improved articulation is needed between what these schools and colleges do in the formal

> education system and what other learning situations and institutions can do to provide opportunities for continuous learning.
>
> We must envision the broadest potential for the educational system--both formal and informal parts--and determine how and when learning opportunities can best be made available. Some things are more readily learned by adults than by youth; it is pointless to keep insisting that everything worth knowing has to be learned in school before one embarks on a career. The public should have a much wider range of choices and a much stronger voice in where and how learning opportunities are provided (Rice 1970 xii-xiii).

Cross (1981) has offered a typology of adult participation based on organized instruction, self-directed learning, and participation in credit courses. Whatever the type, participators in adult education are, for the most part, volunteers whose lives as learners are not governed by educational structures but by their roles as workers, citizens, parents, or spouses. Even those who face mandatory continuing education as part of their jobs or professions still largely control how and in what ways they will fulfill their obligation. As a result the educational experience becomes, in Houle's (1972) terms, a cooperative rather than an operative exchange between learner and educator.

Knowles (1970 1984) has articulated that viewpoint in his reconceptualization of andragogy as a distinguishing feature of the adult learning. The first of Knowles' (1970) andragogical assumptions was the shift occurring in adulthood from the position of dependence in

the learning process to one of increasing independence. Self-direction conveys well the meaning of that notion of "independence in learning." As Brookfield (1986) noted, self-direction is not learning a set of techniques governed by educational objectives and evaluative criteria set by others. Rather, self-direction is at the core of the adult's assumption of control over both learning goals and the criteria by which their achievement will be judged.

While it is important to understand assumptions about adult learners and the modes of learning, it is also helpful to know who actually participates in adult education. The interest in participation is important for strategic reasons. Because of the voluntary character of adult education, knowing who they are and why they participate is critical if providers are going to match learning opportunities with student needs, concerns, and attitudes. Furthermore, statistics about adult participation in continuing education are not as readily available as they are for the formal schooling system. Studies of adult participation, then, become essential if public policy on adult education is going to be shaped so that equal access to quality education for all age groups can be attained.

Cross (1981) has pointed out that the national survey of adult participation in continuing education completed by Johnstone and Rivera (1965) stands as a hallmark of what we know about participators. One of their achievements: Johnstone and Rivera were the first researchers to include both organized instruction and self-directed learning as part of an adult's report of participation in continuing education. Data collected by the Bureau of the Census, the major source of what was known about participation, were based on a definition of education centered exclusively on organized activities provided through traditional structures.

In summaries of the research on participation, Cross (1981) found that previous educational experience and age tended to be the most potent predictors of participation. Rates of participation seem to be correlated with the amount of education one has had: college graduates participate in more adult education than high school graduates, who more often participate than those who did not complete high school.

It is in the context of this wider societal phenomenon that the continuing education participation of professionals is examined. As Houle (1980) reported from his investigations, professionals face the necessity of continued learning with an urgency that may not be part of the average citizen's life. Technology and the

expectations for high levels of expertise compel professionals to seek out new information and ideas. Requirements for re-licensure serve as reinforcement for this need. What is shared by professionals and other adults, however, is the common search to understand and to acquire the knowledge, attitudes, values, and skills that will make a difference in what they do and how they live. This commonality is at the heart of adult education.

In summary, adults participate extensively in learning and exercise clear self-direction in what and how they participate. While estimates of participation vary widely from 12 percent of the population (National Center For Educational Statistics 1980) to 98 percent (Tough 1979), organized instruction (noncredit and for credit) and self-planned projects are the primary types of adult continuing education. Participation in for-credit courses and degree programs is rapidly becoming a third major type for adults (Cross 1981).

Arden Grotelueschen (1985 Chapter 3), like Cyril Houle, commented in an article that much research had taken place in the area of participation in continuing education, but its focus was on the general adult population. "It is important to make a distinction between continuing education in general," he wrote, "and continuing professional education in particular"

(Grotelueschen 1985 35). His thesis was that continuing professional education was unique and distinct from continuing general adult education on three grounds: the referent population, the nature of participation, and the educational benefits derived from participation. Research about motivation for participation in continuing professional education, Grotelueschen concluded, required a recognition of the uniqueness of that population.

Grotelueschen based his research of professionals' reasons for participation on Houle's (1961) typology of adult learning orientations. Houle, as previously reported, described three learning orientation categories: activity-oriented, learning-oriented, and goal-oriented. The Houle typology was the basis of the Reasons for Participation Instrument (Burgess 1971) and the Education Participation Scale (Boshier 1971; Boshier & Collins 1982). While these instruments provided valuable information, they were of limited applicability to unique professional populations.

Aslanian and Brickell (1980) examined the characteristics of learners and nonlearners among several studies and concluded that the rate of adult participation in learning is about 50 percent.

The contrasts between the two groups include:

learners are considerably younger than nonlearners.
learners are considerably better educated than nonlearners;
adults with high incomes are more likely to learn;

employed adults are far more likely to engage in learning than unemployed adults;
of all occupational groups, adults engaged in professional and technical work are most likely to learn, while those in farm work are least likely;
adults employed in business and professional fields are more likely to engage in learning than those employed in agriculture, mining, construction, and transportation; and
learners are slightly more likely to live in urbanized areas.

Continuing Professional Education Literature

The difference between continuing education and continuing professional education is in the focus of learning. Cervero and Scanlan (1985) described the difference between continuing and continuing professional education in the following way:

> Continuing education may be thought of as a generic field of practice and research. Continuing professional education is a subspecialty of continuing education that focuses on programming for persons who have earned their professional qualifications in some field and who have subsequently sought additional educational experience to remind them of what they once known and have forgotten, to acquaint them with knowledge that has developed since they earned their qualifications, and to help them solve personal and professional problems of various kinds.

Professionals, as a group, are most likely to continue their education, in part, to uphold their professional obligations.

Involvement Behaviors

In the third sphere the studies of mandated professional continuing education and that which is elective are examined; the comparisons with other professions which the study does not propose to observe (pastors, nurses) are explored; and relevant data are related to the current study.

A general model for education was described in 1949 by Tyler in his book Principles for Curriculum. The essence of the model lies in four questions: (1.) What educational purposes should the program seek to attain? (2.) What educational experiences can be provided that are likely to attain these purposes? (3.) How can these educational experiences be effectively organized? (4.) How can it be determined whether these purposes are being attained?

Two arguments for professional training are made by Rice (1970) and Hesburgh, Miller and Wharton (1973). Rice advances the argument that:

> Not all professional education is carried out in universities. Much, if not most of it, is conducted by the professional bodies to which society has delegated its authority;.... Moreover, teachers of professions, according to my definition, have to teach practice as well as theory. Until new teaching techniques are developed, much of the learning has to be by apprenticeship, and, if the teachers are to retain the respect of their students, this means that they have to practice themselves.

> Finally, there are the professions, such as law, architecture, divinity, or the arts, in which the teaching of practice, as well as of theory can be conducted in private. In other words, apprenticeship can be postponed until the students leave the university. Members of the faculties of these professions do not have to practice in the public arena, and thus expose themselves to public scrutiny (as, for example, the clinical members of a medical school faculty have to do). As against this, however, those who spend all their time in teaching and research are not infrequently felt by their students, as well as by their practicing colleagues, to have avoided many of the harsh tests that professional practice involves (74-75).

Belsheim (1986) writes of the three models for continuing professional education (CPE): (1.) education model, reflecting the mainstream of CPE practice and focusing on educational objectives, teaching methods, organization of educational experiences and assessment; (2.) a social change model, which considers the total environment in which CPE occurs; and (3.) a problem-based model, which focuses on the professional context and order of complexity of professional problems. Using these models, he describes strengths and drawbacks applied to continuing medical education.

The education model focuses on the content or knowledge the participants should learn, and this focus has led to a streamlining of the process by which course designers develop educational objectives for a continuing professional education program. Typically, the teaching

methods used in the education model require participants to read journals, complete home study courses, and attend meetings, conferences, or classes.

The social change model focuses on understanding the broader context within which CPE occurs. The components of the model are the change objective, the target system, the change-inducing system, strategies for change, resistance to change and stabilization of change.

The change agent--the individual or group that is seeking to implement change--selects strategies for making the change in the selected environment and plans the procedure. Commonly, social conscience organizations like the American Cancer Society are seen in this role. Peer pressure is often involved in this system of change, and resistance is a key concept. The change of convictions or practices of individuals is the key to social change, and the lessening of resistance is the first step in promoting change.

The problem-based model for CPE incorporates the principal of organizing a course around the active participation of the learners, in discussion of problems and resolutions for the problems they face, rather than organizing around lectures covering specific content.

Both the education model and the change model are often dominated by content experts. Inherent in both models is the assumption that experts and those committed

to change know what is best for the participants or the systems in which the participants work. However, this may not be the case; and making this assumption when designing programs is not necessarily the best procedure, particularly when the participants are highly skilled professionals.

Houle (1964) concluded that professional education in itself was intrinsically incomplete and needed to be reconceptualized to include a focus on continuing education. Houle was convinced, first of all, that not everything can be learned within the restrictions which a curriculum of study realistically places on people. Time, readiness, and setting prevent one from amassing the totality of learning one will need for a lifetime of professional practice. Second, some things that are taught are in error or already obsolete based on advancements or experience of the field. Third, the obligation of professors is not simply to teach information, critical as it is, but also by word and example to help form an attitude toward lifelong learning as students progress through the curriculum. Houle also argued that acceptance of students for professional study should be based on their level of commitment to inquiry as well as on traditional standards of aptitude.

Having laid out what he believed to be compelling reasons for the important place of continuing education within one's understanding of professional training, Houle (1964) then listed what he felt were the areas of need for a learning profession:

> (1) the need to keep up with new knowledge in the professions;
> (2) the need to establish mastery over new conceptions of the profession;
> (3) the need to study basic disciplines supporting the field; and
> (4) the need to grow as a person.

While Houle was faithful to his sense of the practical in education in delineating these areas, he maintained a careful balance between the practical (e.g., the need to keep up with new knowledge) and the qualitative dimension of being professional (e.g., mastery of new conceptions of the profession, growth as a person).

Houle had included a similar cataloging in his The Inquiring Mind (1961) in which he concluded that adults participate in learning in order to (a) pursue some usually utilitarian goal, (b) enjoy the activity associated with the learning setting, or (c) seek the learning for its own sake (Rachal 1988).

In his systematic treatment of these issues and needs in Continuing Learning in the Professions, Houle (1980) expanded the way in which he approached the basic

idea of profession. While he did not abandon an appreciation of the classical notion of profession, Houle concluded that the criteria for denoting a profession often were viewed as static in character -- a phenomenon he described as professionalism (24). As a result of his study, Houle argued that the classical professions (medicine, law, ministry, teaching) had to share space with a growing number of occupations seeking recognition and acceptance as professions. For Houle, this reality called for a dynamic sense of professionalization (p 26) that not only guided an occupation in its search to be a profession but also served as a framework for the "arrived professions" in assessing themselves.

Houle's Continuing Learning in the Professions (1980) stands as a major contribution to understanding the interaction between professionals' lives and education. This volume brings together Houle's earlier reflections on continuing education for professionals (1967) and helps anchor the research for this study. It is important to note that Continuing Learning in the Professions is not an empirical study but is an analytical review of the literature covering seventeen different professions. Houle's conclusions have yet to be subjected to rigorous empirical research but nonetheless have guided the practice and research of those who work in the field of adult education.

Houle's (1980) characteristics of "professionalization" contain the standard criteria typically used to define a profession. These include specialized knowledge, a formal program of preparation, high social value and recognition, autonomy, authority of clients, and a sense of service. While Houle's schema used these characteristics as a means for discriminating between occupational groupings, he proposed that any group -- the arrived professions as well as those seeking recognition as professions -- needed to view each of these characteristics as a developmental continuum rather than as a simple dichotomous criterion. The profession or occupational group, therefore, could describe itself in terms of the extent to which it met the characteristics of the professionalization process.

Though Rachal's terminology differs from that of Houle, terms such as "self-help, leisure" in Rachal are roughly analogous to Houle's "activity learning" as both can be described as leisure adult education.

Rachal depicts his proposed typology as a content-purpose approach tree. That is, the label suggests the type of content in each category as well as suggesting the purpose of that form of adult education. Five major categories--liberal, occupational, self-help, compensatory, and scholastic--and several subcategories

emerge, all of which are "rooted" in a variety of agencies and institutions. Visually the scheme is represented as a tree.

The liberal branch would include individual or group structured study of the humanities, arts, and sciences, where emphasis is on free inquiry, curiosity, and intellectual growth, and away from utilitarian purposes or persuasion to partisan points of view. It is problematic to determine the percent of total adult education activities which currently could be classified as liberal education, but one might conjecture with Rachal that ten percent of adult education based on courses might be labeled "Liberal."

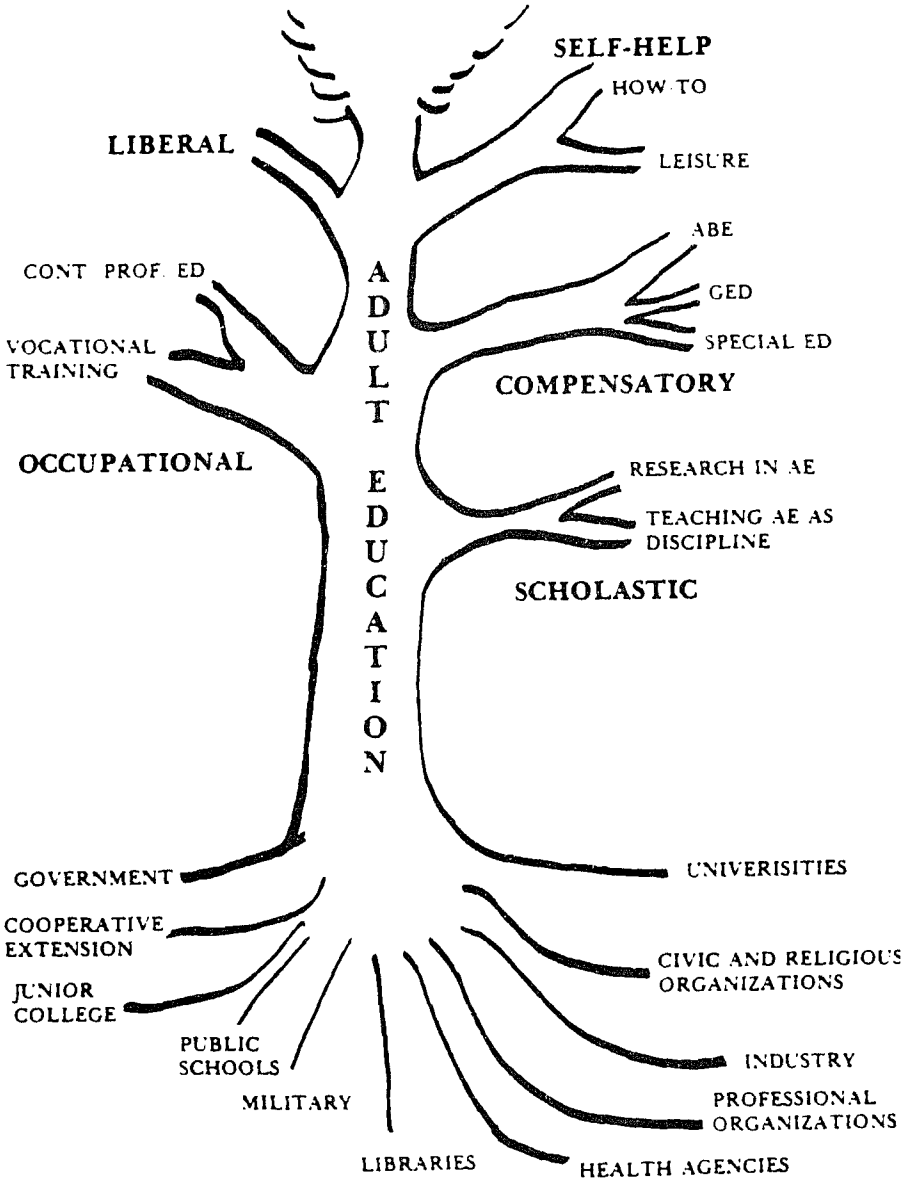

FIGURE 1: The Rachal Tree

With the Occupational Limb one is on much firmer ground in terms of percentages. Combining job related reasons with obtaining or renewing a license or certificate, according to Rachal, accounts for almost 80 percent of the adult education courses.

The third (Self-Help) limb of the tree reflects the myriad learning activities where individuals seek knowledge, information, skill, or recreational learning in order to better adjust to their environments outside of work. The learning may be highly situational and the need for it transient, or it may respond to a more general need for activity or personal enrichment. This area, roughly analogous to Houle's (1961) activity learning, can be aptly described as leisure or enrichment adult education. It is the second largest limb of the Rachal tree with about 26 percent of courses categorized here.

Compensatory adult education is a relatively small limb which includes programs for those who have not completed the traditional 12 grades of school.

The scholastic limb divides into two branches: graduate study in adult education and research in education.

All of the limbs of the tree have their roots in a variety of agencies and providers such as government agencies, health care providers, and industry. Such a

diversity of organizational providers tends not to yield discrete, easily divisible and identifiable adult education types. Therefore, general categories which inevitably overlap must be employed for description. This is but one model of the manner in which education is supported and supplied by a variety of sources.

Rachal's combination of agencies which provide educational support is not an indication that each is responsible for a facet of education, but only that each participates with the others to provide the whole scope of the educational foundation.

Grotelueschen based his research of professionals' reasons for participation on Houle's (1961) typology of adult learning orientations. Houle, as previously reported, described three learning orientation categories: activity-oriented, learning-oriented, and goal-oriented. The Houle typology was the basis of the Reasons for Participation Instrument (Burgess 1971) and the Education Participation Scale (Boshier 1971, Boshier and Collins 1982). While these instruments provided valuable information, they were of limited applicability to unique professional populations.

Grotelueschen (1977 1979 1985) observed that to be of practical value a narrowly focused conceptual model must be developed for studying participation in Professional Continuing Education and for supporting

research methods and instruments. The Participation Reasons Scale (PRS) was designed to assist in the development of such a model and was initially tested and validated with business professionals (Grotelueschen 1979). In a subsequent study with physicians Grotelueschen further validated the PRS for identifying underlying dimensions of reasons for participation in Professional Continuing Education. Cervero's study shows that the complex reasons for physician participation in continuing education fall under four major headings: (1.) to maintain and improve professional competence and service to the patient, (2.) to understand oneself as a professional, (3.) to interact with colleagues, and (4.) to enhance personal and professional position (Cervero 1981).

An instrument developed for professionals was the Participation Reasons Scale (Grotelueschen, Harnisch & Kenny 1979). The Participation Reasons Scale was administered to random professional population samples on a local, state, regional, and national level. These samples included veterinarians (Harnisch 1980), judges (Catlin 1982), and public health administrators (Macrina 1982). The findings were reported at national professional meetings (Grotelueschen, Harnisch & Kenny 1979; Grotelueschen, Harnisch, Kenny and Cervero 1980

1981); reported in dissertations and unpublished reports (Catlin 1982); and published in professional journals (Catlin 1982; Cervero 1981).

Using the thirty question Participation Reasons Scale, Grotelueschen clustered motives for professional participation into six orientations (Grotelueschen 1985 40-41): "(a) professional improvement and development, (b) professional service, (c) collegial learning and interaction, (d) professional commitment and reflection, (e) personal benefits and job security, and (f) professionalism."

Three assumptions undergirded The Participation Reasons Scale for professionals. First, participation was a purposeful activity that should yield outcomes relevant to professional practice. Second, participation was for fundamentally professional reasons. (The Participation Reasons Scale limited the orientations to the practice domain of professionals and did not include the psychological domain.) The final assumption was that The Participation Reasons Scale incorporated both the traditional and less traditional clusters of reasons for professional participation. An example of the traditional clusters included was "professional development and improvement;" an example of the less traditional clusters included was "personal benefits and job security."

The Participation Reasons Scale was designed to be administered in conjunction with a Respondent Information Form. The form was used to collect demographic data of two types: data which were common to all professions, and data specific to a given profession. The findings that resulted from this combination of survey instruments were as follows (Grotelueschen 1985 40): different individual reasons for participation; differences among reasons across professional boundaries; and the existence of relationships between demographic characteristics and reasons for participation. Therefore, motivation for participation did not vary significantly between different professions, nor the career states of the professionals, nor the demographic characteristics of the participants of continuing professional education. Grotelueschen commented on the lack of differences between professions when he wrote (1985 41):

> Studies conducted among veterinarians, judges, physicians, business professionals, nurses, dentists, social workers, pharmacists, and health educators suggest that, across professional lines, professional improvement and development items represent the most important cluster of reasons for participation, followed, in order of relative magnitude, by professional service, collegial learning and interaction, professional commitment and reflection, and personal benefits and job security.

A 1981 study of judges used a "Judge Form" of the PRS, a self-reporting instrument which asks respondents to rate the relative importance of 28 educational and

practice-related reasons for participation (Catlin 1982). The reasons for participation in continuing education statistically elicited were: (1.) professional perspective--a desire to do the job well; (2.) judicial competence--doing the job right; and (3.) collegial interaction.

The Task Force on Continuing Professional Development of Engineering Faculty has noted that in the engineering field professionals enhance their competence in their profession through participation in professional continuing education (Anderson 1985). Another study of engineers shows 32 percent of engineers hold a Master's Degree and 21 percent have a Ph.D. in engineering. The study also shows that because of the relatively high salaries in the field many engineers take jobs upon completion of the BS degree and obtain some practical experience before continuing their education on a part-time basis (Jagacinski et al. 1985).

As one might surmise, more has been written about the professional continuing education of educators than about professional continuing education in the other professions. Arends (1983) investigated three questions with respect to continuing professional education of beginning teachers: (1.) what is the extent and nature of learning experiences; (2.) what are the types of judgments made about those experiences; and (3.) what are

the personal characteristics that may account for the continued learning? He found an underlying assumption in the profession that beginning teachers "will continue as learners during their induction period until status as fully competent professionals is attained" (Arends 1983 235).

Arends also found that beginning teachers devoted a remarkable amount of time to deliberate, professionally related learning. Much of this time is in evening and summer school classes, but many other types of education or learning experiences are also sought by new teachers. In all, the conservative definitions used in the study isolate 18 discrete types of learning experiences. TABLE 4 illustrates his findings.

Ministers were conspicuously absent from the list of professionals researched by the method until the late 1980's. Studies by Bacon (1988) and Kitonga (1989) investigated two subsets of ministers. Kitonga's research confirmed the findings of earlier studies of other professions and self-directed learning.

The conclusions were that ministers found reading books as the most preferred learning activity, and had a pronounced desire for educational pursuits in which they had active personal participation.

There were no significant difference in preferences among age levels, locations, or length of professional service. Learning barriers included lack of funds, professional stress, and an inability to arrange time for learning.

TABLE 4. Teacher Time and Learning Activity

Type of Learning Activity	Number of Activities and Hours Reported by 34 Teachers			
	N	%	Hrs	%
Workshops	83	23.3	1,426	14.4
Conferences	80	22.5	894	9.0
Summer school	37	10.4	3,266	33.0
Night classes	36	10.1	1,323	13.4
Clinics	33	9.3	1,022	10.3
New teacher orientations	20	5.6	169	1.7
Curriculum work	16	4.5	190	1.9
Presentations/performances	14	3.9	179	1.8
Observations	13	3.7	118	1.2
Technical assistance	6	1.7	39	>.1
Independent study	3	.8	667	6.7
Educational travel	3	.8	276	2.8
Student teaching supervision	3	.8	180	1.8
Private lessons	3	.8	112	1.1
Community study	2	.6	12	>.1
Field testing materials	2	.6	5	>.1
Faculty study groups	1	.3	15	>.1
Field trips	1	.3	8	>.1
Totals	356	100	9,901	100

Slightly more than 100% due to rounding procedures

(Data from Arends 1983 238)

Studies on Clergy Professional Continuing Education by Bacon (1988) and Kitonga (1989) examined clergy participation. Other researchers examined Social workers (Akintade 1985) and Health and Safety workers (Parham 1988; Bell 1979).

Bacon (1988), in a survey study of 410 randomly selected responding Missouri Synod Lutheran ministers, found that respondents ranked the reasons for participation in Professional Continuing Education into six groupings in descending order: (1.) Professional improvement and development; (2.) professional service; (3.) professionalism; (4.)collegial learning and interaction; 5) professional commitment and reflection; and (6.) personal benefits and job security (page 92).

Bacon reported the following results. First, the reasons for participation include: professional improvement and development, professional service, collegial learning and interaction, and personal benefits and security. Second, there does not appear to be a difference between the professional population and the clergy regarding the reasons for participation. Third, there is a negative correlation between age and attendance for personal security. It is likely that as a pastor ages he or she will not attend continuing education events in order to derive personal benefits and job security.

Parham (1988) studied Health Education alumni/ae in finding types of participation factors and deterrent factors relative to university department sponsored professional development programs at the University of Georgia. The open ended in-depth interview technique and ensuing analyses resulted in the emergence of five participation factors: (1) interaction with colleagues, (2) expansion of knowledge, (3) employer support, (4) employer expectations, (5) relevance of topic, and (6) relevance of speaker.

The five deterrents included: (1)inadequate publicity, (2) too little notification to plan to attend, (3) relevance of target population of program, (4) relevance of topic(s) and speaker(s), and (5) time constraints.

A study of social workers using a random sample of 106 practitioners in the state of Texas, where continuing education is mandatory, and of 94 in Louisiana, where continuing education is voluntary, ranked factors of deterrence to continuing professional education (Akintade 1985).

Akintade's examined six factors deterring participation in professional education. He concluded that social workers in both states considered work constraint as a major factor deterring participation in continuing professional education. Cost and lack of

quality were also cited as barriers to the efforts of the social workers to gain education. There was no difference in the order in which social workers in the two states ranked deterrents to continuing education.

Phillips (1987) indicated that researchers have been reluctant to generalize about the effectiveness of continuing education on performance because of the number of variables which also affect performance, but such studies with physicians show differing behaviors as a result of particular programs.

An estimated 70 to 75 percent of all professionals regularly and voluntarily participate in continuing education. They report little or no change in their participation with the implementation of a mandate except for added documentation and reporting to the licensing board. "The greatest changes occur with the remaining 25 to 30 percent who are termed 'laggards' --licensees who do little more than the minimum to remain in practice. Surprising numbers of these laggards are finding renewed interest in their professions and in professional activities" (Phillips 1987 60).

Mandatory continuing education has been implemented by the states as a means of strengthening the re-licensure process. Typically, legislation requires all licensees in many professions and occupations to participate in certain amounts of continuing education in

the hope that such participation will enhance their performance. There is evidence that benefits are being derived from such requirements.

This statutory movement, which began in the late 1960's and grew rapidly in the 1970's, seemed to slow about 1980, especially for the health professions. Several nonhealth professions have shown significant increases in the numbers of states requiring mandatory continuing education in the last several years.

Twenty-one states currently require continuing education for physicians, 20 require it for lawyers, but only two require continuing education for engineers (Phillips 1987). Though states do not always require continuing education, professional societies and certifying agencies may. Often these requirements operate in tandem with statutory requirements; even without statutory mandates the requirements frequently have the same essential impact.

Study Development

The fourth sphere of literature examined was the construction of statistically sound studies of small populations and reporting of statistically significant findings.

The use of surveys and concern for ethical issues are completely interwoven. Surveys are conducted because of the need to know; ethical considerations protect the individual's right to privacy or even anonymity. Confidentiality is protected by the "Protection of Human Subjects" guidelines of the Code of Federal Regulations. Confidentiality refers to the safeguarding of any information about any one person that is known by another (Fink & Kosecoff 1985). The approval of the Michigan State University Committee on Research Involving Human Subjects (UCRIHS) was obtained before the research was begun.

All studies have certain procedures in common--statement of a problem, collection of data, analysis of data, and drawing of conclusions. Beyond these, however, specific procedures are to a high degree determined by the research method. Each research method is designed to answer a different type of question.

Sampling

In a survey of a population, it is common to first take a random sampling. The procedure for selecting a random sample has widespread agreement in research and statistics texts and guide books. Alreck and Settle's guide lists:

For Selecting a Random Sample

1. For nth name sampling, divide the number in the population by the number to be sampled for the value of n.
2. Randomly pick the first unit for the nth name sample from the first one through n entries of the frame.
3. Random number generators often produce near-perfect random lists, often without duplicates and ordered from lowest to highest.
4. When a "seed" number is required by a random number generator program, it should be picked at random.
5. Statistics texts often contain random number tables and the instructions for their use must be followed carefully.
6. When units from the sample frame can be identified on small, physical objects, mechanical devices can be obtained or created to make random selection. (Alreck & Settle 1985 75)

In a simple random sampling the investigator chooses a subset of respondents at random from a population. This type of sampling is not always the best when investigating a small, relatively homogeneous population. In that instance it may be best to use a stratified random sample. In stratified random sampling, the investigator first subdivides the population into subgroups or strata and then selects a given number of respondents from each stratum to get a sample.

One can use stratified random sampling to get an equal representation. This method of sampling can be more precise than simple random sampling because it homogenizes the groups. The advantages of stratified random sampling, according to Fink and Kosecoff, are:

"(1) it can be more precise than simple random sampling, and (2) it permits the surveyor to choose a sample that represents the various groups and patterns of characteristics in the desired proportions" (Fink & Kosecoff 1985 56).

Alreck and Settle say the specification of the sampling design begins with identification of the population to be surveyed. As guidelines for identifying populations and sample units and for selecting a sample frame, they submit three guide lists:

For Identifying Populations

1. Be sure the population consists of those people who actually possess the information sought by the survey.
2. Identify all of the major factors that would otherwise "qualify" respondents and make their responses meaningful to the sponsor.
3. List the criteria for inclusion and exclusion of respondents, together with the decision rules to be used. (Alreck & Settle 1985, 70).

For Specifying Sample Units

1. The sampling unit should be specified so that it is the smallest single entity from which the data can be obtained.
2. If the unit contains several individuals who might provide different data, the specification of the unit is too broad and should be narrowed.
3. If responses from individuals would be redundant or overrepresent some entities, the specification is too narrow and should be broadened.
4. If the survey data are to be compared with existing survey or secondary data, the same sample units must be used for the survey or the data will not be comparable.(Alreck & Settle 1985 71)

For Selecting a Sample Frame

1. The sample frame is required to identify the entities of units to be surveyed.

2. The sample frame should be all-inclusive, so that every unit in the population to be surveyed is included.
3. The frame for the sample should exclude any units that are not part of the population being surveyed.
4. The entries listed in the sample frame must be specified in exactly the same way as the sampling units were specified.
5. When the sample is clustered, stratified, or both, the sample frame must indicate cluster boundaries and/or strata membership for the individual units.

There are, to be sure, disadvantages of stratified random sampling. "It requires more effort than simple random sampling and it often needs a larger sample size than a simple random sample would to produce statistically meaningful results" (Fink & Kosecoff 1985 56).

Babbie (1973) writes of the issues of populations and sampling frames in survey research. He lists the main guidelines as:

1. Sample survey findings can be taken only as representative of the aggregation of elements that comprise the sampling frame.
2. Often, sampling frames do not truly include all the elements that their names might imply. (Student directories do not include all students; telephone directories do not include all telephone subscribers.) Omissions are almost inevitable. Thus a first concern of the researcher must be to assess the extent of omissions and to correct them if possible. (Realize, of course, that he may feel he can safely ignore a small number of omissions that cannot easily be corrected.)
3. Even to generalize to the population comprising the sampling frame, it is necessary for all elements to have equal representation to the frame: typically, each element should appear only once. Otherwise, elements that appear

> more than once will have a greater probability of selection, and the sample will, overall, overrepresent these elements.(Babbie 1973 91)

A Stratified Sample meets some specific design needs. According to Alreck and Settle:

> To Choose a Stratified Sample Design
> 1. Is there a requirement for greater reliability and a larger sample for some strata than for others? If so, stratification would be practical.
> 2. Are there indications that there is too little population variance within strata and large variation between strata? In such cases, stratification is recommended.
> 3. Is it possible to obtain or create a sample frame indicating strata membership for individuals? If not, stratification is difficult or impossible without quota sampling.
> 4. Can respondents' strata memberships be determined in advance by observation or questioning with a quota system? If they cannot, stratification is not feasible (Alreck & Settle 1985 80).

"Stratified sampling is based on this ... factor in sampling theory. Rather than selecting your sample from the total population at large, you ensure that appropriate numbers of elements are drawn from homogeneous subsets of that population" (Babbie 1989 188).

"Stratified samples will produce sampling errors that are lower than those associated with simple random samples of the same size for variables that are more homogeneous within strata than in the population as a whole if rates of selection are constant across strata" (Fowler 1984 39).

Methods of Stratification

There are two predominant sortings of populations for stratification:

> into discrete groups based on whatever stratification variables are being used;" and "on the basis of the relative proportion of the population represented by a given group, select--randomly or systematically--a number of elements from that group constituting the sample proportion of the desired sample size" (Babbie 1989 189).
>
> The size of the sample is adjusted in order to meet study capabilities and the degree of confidence required. The more the respondents are likely to differ on the key items of the survey, the larger the sample must be in order to reach a given level of confidence. Casual observation of the population may provide some indication of diversity. The process of determination will require some judgment and the refinement of experience.
>
> Before determining the actual sample size to use, the researcher should be aware of the maximum and minimum practical sample sizes that apply to virtually all surveys. "Ordinarily, a sample of less than about 30 respondents will provide too little certainty to be practical, and usually experienced researchers regard 100 or so respondents as the minimum sample size when the population is large" (Alreck & Settle 1985 88; Gay 1976; Cates 1985).

It is seldom necessary to sample more than 10 percent of the population to obtain adequate confidence, providing that the resulting sample is less than about 1,000 and larger than the minimum cited. "In general, the minimum number of subjects believed to be acceptable for a study depends upon the type of research involved. For descriptive research, a sample of 10 percent of the population is considered minimum. For smaller populations, 20 percent may be required" (Gay 1976 77).

Rationale for the Interview Format

Alreck and Settle indicate a number of reasons to use interviews rather than mail surveys. Among those are the several contingencies where the question to be asked depends upon a previous response. When there is a likelihood of interaction between the tendency to respond and the issues of topics being measured or assessed, the interview is more flexible, and if the recording and interpretation of response must be done by a field worker clarification can be added with continued questions (47).

In presenting the efficacy of data collection methods, Alreck and Settle present the following chart which makes a comparison between personal interview, telephone interview, and mail questionnaire in terms of considerations the researcher must take into account.

TABLE 5. Comparison of Data Collection Methods

	Personal	Telephone	Mail
Data collection costs	High	Medium	Low
Data collection time required	Medium	Low	High
Sample size for given budget	Small	Medium	Large
Data quantity per respondent	High	Medium	Low
Reaches widely dispersed sample	No	Maybe	Yes
Reaches special locations	Yes	Maybe	No
Interaction with respondents	Yes	Yes	No
Degree of Interview Bias	High	Medium	Low
Severity of non-response Bias	Low	Low	High
Presentation of visual stimuli	Yes	No	Maybe
Field worker training required	Yes	Yes	No

(Data from Alreck & Settle 1985 57).

In terms of achieving good response and results with a minimum of cost, the telephone interview is the preferred method of survey for the instant study. Access to the population in the circumscribed area, the allowance for interaction by the researcher with the minimum introduction of bias because of a single researcher, and the low cost factor are the attributes which make the telephone interview the method of choice.

As Alreck and Settle note:

> the telephone interview process can be undertaken from one central location, using one namelist. Telephone calls can be critical for:
> ...the time of day and days of the week during which calls are placed will affect the type of respondents that are obtained. (p. 251)
> The length of the telephone interview can be 5 to 10 minutes at the longest with a low level of refusal or terminations. Beyond that time limit the intrusion and inconvenience becomes too taxing for most respondents. (47)

> Usually the telephone interview must be shorter than a personal interview, and considerable resistance or premature termination of the interview by respondent can result from interviews of more than 15 or 20 minutes. Without the physical presence of the field worker, interviewer bias is likely to be less with telephone interviewing...(Alreck & Settle 1985 41).

Interview Construction

The telephone interview was selected as the most economical method of collecting data with an open-ended interview format. The strengths of this format for the instant study are:

1. potential for a short data collection period;
2. the advantages of interviewer administration in comparison to mail surveys;
3. small staff needed, it need not be near the sample;
4. the interaction with the subjects and open-ended questions will enrich data collection; and
5. lower costs in comparison with personal interviews (Fowler 1984).

It is important that the questions in the interview lead from the least to the most difficult in terms of response. The non-alarming elicitation of facts comes first with demographic and educational background questions. The attitudes are queried last and the respondent is given opportunity to explain his or her answers (Alreck & Settle 1985 100).

The questions must be constructed in such a way as to be complete and totally understood by the respondent. The questions must focus on a single issue. In asking a series of questions which will have multipart or scaled

response choices, the scale was presented first and the respondent was questioned about his or her understanding of the scale before items were answered.

Once the interview schedule has been prepared and potential answers estimated, it is presented for preview or pretest to a selection of qualified professionals from the four professions to be used as the study population.

The Pretest

> Pretesting is a very useful way of catching confusing and unclear questions prior to the actual data collection process (Allen 1973 53).
> ...pretests represent initial tests of one or more aspects of the research design. Most commonly, this has meant the administration of a draft questionnaire to a group of subjects, but the concept of pre-testing is more broadly applicable (Babbie 1973 205).

Borg and Gall (1983) recommend a pretest of the questions in order to locate ambiguities. For a pretest they recommend selecting a sample of individuals from a population similar to that from which one plans to draw research subjects.

In pretesting the document, the questions should provide for respondents to comment about the form of the question, the placement of it, and about the probable responses. The pretest should also allow for suggestions which can lead to improving the instrument (425-426).

A further caution is issued about the use of the interview because it is a highly subjective technique. The interviewer should seek to determine from the pretest whether any of the questions is perceived as threatening and if all of the questions are easily understood.

The Pilot Study

Following the pretest and the necessary revisions the investigator needs to conduct a pilot study. In selecting a sample for the pilot study it is suggested that the investigator first select the final sample and then the pilot study sample, or select the initial sample with enough subjects for both studies.

> Unlike a pre-test, a pilot study should be directed at a representative sample of the larger population. The pilot-study sample, then, should be selected in exactly the same fashion as intended for the final survey. One exception may be entered in this regard, however. Since the researcher may wish to avoid studying the same respondents in both the pilot study and the final survey, he may wish to select both samples at the same time as an insurance against the possibility (Babbie 1973 211).
>
> In order to make the necessary decisions concerning the appropriate sample size for a survey, the researcher must somehow anticipate at least two types of results before hand: Variance in the population for the key variables to be measured, and distributions of response for items that will form implicit subsamples during analysis. There may be cases when it is virtually impossible to anticipate one or both of the two types of results. If so, the researcher has two options, either of which might provide the data necessary to the decision. One option would be to conduct an informal pilot survey to obtain responses to only

> the key variables. These results would be tabulated to reveal the degree of variance and confidence intervals that might be expected from the actual survey, as well as the percentage distributions of response to the categorical items. The advantages of a pilot survey are simplicity, speed, and economy. Only a small number of respondents and a few questions are required (Alreck & Settle 1985 92).

"As nearly as possible the pilot study should involve the administration of a research instrument identical to the one intended for the final survey" (Babbie 1973 212).

In an attempt to tease out any error potential in the study, the investigator applies data analysis techniques to the pilot study data.

Small Group Statistics and Data Analysis

The two most common techniques used for data analysis that implicitly create subsamples are cross-tabulation and breakdowns of averages. For example, respondent age might be broken down to show the average for men and for women, or the sex of the respondents might be cross-tablulated with their responses to a yes/no question. In the first case, two subsamples would be created: males and females. In the second, four implicit subsamples would result: men responding positively, men responding negatively, women responding positively, and women responding negatively (Alreck & Settle 1985 90).

As with any tool, there are two types of things that dictate what statistical tool should be used or would work best: the nature of the data to which it is applied and the nature of the report to be created (Alreck & Settle 1985 287).

The data consist of nominal, ordinal and interval data which are best reported by the presentation of frequency tables, cross-tabulations and charts and graphs. After the data are gathered they were subjected to analysis.

Where there is a relatively small number of values for a variable, the distribution can be described by indicating the number or percent of respondents who indicated each value in a frequency table. The use of frequency tables provides a very complete picture of the distribution of data for the variable. The use of these tables is limited mainly by the number of scale points or categories to be shown. The tables work optimally with fewer than a dozen categories or scale points to be shown.

The statistical tools to measure the relationship between two survey variables include the Cross tabulation or Chi-square statistics and the Analysis of Variance (ANOVA) and correlation analysis. The identification of the variables determines which is the most appropriate of these tools.

The object of cross-tabulations is to show whether or not the distributions for one variable differ significantly for each value or level of the other variable. Cross-tabulations can be hand-tabulated.

The analysis of variance is the appropriate technique to measure the relationship between two variables if the independent variable is categorical and the dependent variable is continuous. Analysis of Variance is a technique to measure the statistical significance of the differences between means. It is similar to the statistical t-test with which more educators are familiar. Analysis of variance can actually be used to measure the association for two values (Alreck & Settle 1985).

Multivariate survey analysis will also be considered after the data are collected. Multivariate survey analysis deals with a number of variables (classifications) and their interrelations rather than merely reporting isolated facts. Multivariate analysis helps to avoid some of the limitations of nonexperimental research and it also reveals intellectually interesting structures among the variables. (Davis 1971 7).

Summary

Chapter two has a review of the literature and related research in distance education, adult education, and continuing professional education areas; and the construction of a descriptive study and interview questionnaires and techniques.

No studies were found to focus on the comparison of the five professions surveyed in the current study; however, there are studies of other groups that were reported as relevant to at least one of the professions (engineer, lawyer, physician, K-12 teacher or professor) under investigation.

Some of the earlier research has been compared by Cross (1981) and some of the concepts expressed by Houle (1961 1964 1981) and Rachal (1988) have been compared.

The arena of continuing professional education is explored by considering reports of engineers, physicians and business professionals (Grotelueschen 1961; Grotelueschen & Caulley 1977; Cervero & Scanlan 1985) and others who have conducted numerous studies with varied populations and instruments.

Chapter III reports the methodology employed in ascertaining the current state of behavior and attitude concerning continuing professional education, specifically that delivered by distance education means,

within the sample from the five professional groups (engineer, lawyer, physician, K-12 teacher or professor) in the Marquette County, Michigan, area.

CHAPTER III

RESEARCH DESIGN

In this chapter the procedures and methods employed in the study are introduced. A description of the study population, sample selection procedures, the interview schedule questions, pretesting and pilot study procedures, survey study process and data analysis procedures complete the explanations.

The general research question to be explored was: What are the attitudes and behaviors of the members of five professions within the Marquette County, Michigan, area toward distance education as a means of obtaining continuing professional education.

In order to research the questions of: (1) attitude toward continuing professional education; (2) behaviors in continuing professional education participation; and (3) preference for distance education means over traditional means of education, a data gathering process using a telephone interview schedule was employed.

In planning the study, a number of utilitarian considerations came into play. The first consideration was the construction of a study to be completed by a solo researcher, hence the telephone survey. The second consideration was cost. Once again, the small budget available indicated a telephone survey. A third consideration was the selection of a representative sample from the population of professionals. The final consideration was of ordinary limitations, the length of time involved, and the completion of tasks required to complete the study in a timely fashion.

Sampling

There were three major parts to the sampling stage: selection and enumeration of the population, sample size selection and sample selection. Best (1989) cites the stratified random sample, the subdivision of the population into smaller homogeneous groups, as a procedure providing the researcher with a more accurate representation of the population. He suggests a sample size of one hundred with the sample randomly selected proportionately from each subpopulation.

The Population

The first step in selecting the sample was the identification of the populations within the five professions of engineer, lawyer, physician, teacher and professor.

Engineers do not need a State license or registration. The majority of engineers in the Marquette County area are graduates of Michigan Technological University; therefore, the population of engineers was established as all engineers graduated from Michigan Technological University (regardless of specialty area) in the Marquette County area as recorded by the Michigan Tech Alumni office. Staff at the university provided a list of alumni/ae with addresses within Marquette County to the researcher under the guidelines that it be used solely for selecting a sample for this study. The listing is a portion of that which the university publishes in its alumni directory.

Michigan lawyers must, by state law, pass the Michigan Bar examination. The population of lawyers was selected from the annual directory issue of the Michigan Bar Journal, April 1991. This journal lists all members of the Michigan Bar. The geographical and alphabetical listings were cross-referenced to elicit lawyers whose main offices were in Marquette County.

Physicians are required to obtain a State of Michigan license. The physician population was acquired from the Marquette County Physician Registry. The registry operates as a referral service for all physicians practicing in the county and is located at the Marquette General Hospital, a regional medical facility.

The population of teachers at the K-12 level came from the Marquette-Alger Intermediate School District Directory for 1991-92 listing teachers in private and public schools in Marquette County. The Northern Michigan University telephone directory 1991-1992 was the source of the listing of professors. Only NMU staff classified as professor, assistant professor, associate professor or instructor were listed in the population.

Sample Size

The effort to determine sample size was complicated by the consideration and comparison of a random selection process from the whole population and a stratified population with representative samples drawn from each of the sub-populations. An examination of the total populations in each group resulted in: 253 engineers, 107 lawyers, 163 physicians, 832 K-12 teachers and 363 NMU instructors and professors for a total population of 1718. A ten percent sample would have yielded 172 subjects.

As the desire was to reduce error as much as possible, while still keeping the sample of manageable size, the researcher employed a stratified sample design. Babbie (1989) illustrates what most survey texts advise:

> Stratified sampling is a method for obtaining a greater degree of representativeness--decreasing the probable sampling error.
>
> Sampling error is reduced by two factors of design ... a homogeneous population produces samples with smaller sampling errors....
>
> Stratified sampling is based on this ... factor in sampling theory. Rather than selecting your sample from the total population at large, you ensure that appropriate numbers of elements are drawn from homogeneous subsets of that population (188).

To that end, the population was sorted into discrete groups based upon their profession: engineers, lawyers, physicians, teachers and professors. All of the names in the populations were then arranged in alphabetical order and numbered from one to the end of each sample.

Considerations discussed earlier led to a proportionate sample yielding a total of one hundred subjects. Proportionately then the sample was made up of 15 engineers, 6 lawyers, 9 physicians, 48 K-12 teachers and 21 NMU professors. The plan allowed replacement from the pool of randomly selected subjects until the desired number was achieved.

With the aid of a random number table from Babbie (1989, A28) the researcher then drew samples from the populations of each subgroup. The procedure with each sample

drawn was to set a 20 per cent sample goal, lay the random number chart flat on the desk, drop a marker blindly onto the chart to mark the first number and drop a pencil to be used as an indicator of direction in which to read on the table. The table was read in the direction indicated by the sharpened point of the pencil.

Following the indicated process, numbers were read from the beginning point in the direction selected by the random pencil drop until the 20 percent sample limit was achieved. Duplicates were passed over. Oversampling was employed to provide a sufficient representative sample from a population which is mobile and drawn from lists six months to a year old. The process is similar to that explained in Gay (1976, 71-72) and in other sources as an effort to provide for a sufficient sample in which there is a concern for attrition (Borg & Gall 1983).

The Interview Schedule

A telephone interview protocol and an interview schedule (Appendix C) were employed for explaining the study to potential participants, enlisting their participation and eliciting information (data).

The telephone survey was employed because of its efficacy as depicted in Hyman:

> ...I am countering the usual notion that research methods are 'neutral,' that is, merely technical instruments for recording and describing reality that do not in themselves

> change reality. Recognizing that all methods have consequences, that the form and content of interviews affect respondents, allows us to bring forward the question of how interviewing may be changed so as to be less alienating (Hyman 1955, 120).

The first section of the protocol briefly introduced the study and presented statements concerning participation required by the University Committee on Research Involving Human Subjects. Included in the information is the researcher's local phone number and name. In an attempt to allay suspicion the researcher was identified as a 'local' person in the listing of the telephone exchange numbers. The potential subject was also told that the researcher's phone number was in the local telephone book. The introduction contained an assurance of confidentiality and non-identification of the subject and a statement about the researcher's purpose in the study.

The consideration of question types was made before the interview schedule was prepared. For some of the questions the fixed alternative query which yielded nominal or interval data depending upon the answer possibilities, was appropriate. Yes and No questions, which forced answers to form a nominal but dichotomous pattern, were seen appropriate for a portion of the schedule. Finally, Interval or Likert questions with a scale of responses were seen as most appropriate for a battery of questions. An eleven point scale was used (Campbell & Stanley 1963).

The questions in part one of the protocol began after the researcher secured cooperation and commitment from the subject. Suggestions from Babbie (1989) are followed in determining the types of questions:

> Two guidelines should always be followed in the construction of closed-ended questions. The response categories provided should be exhaustive; they should include all the possible responses that might be expected.
>
> Second, the answer categories must be mutually exclusive, the respondent should not feel compelled to select more than one (141).

The questions began with benign queries about where the subject was reared and educated. The questions about locus and year of degree which allowed entry into practice were to gently elicit whether the respondent is of Upper Peninsula, rural or urban background and the number of years of practice in the profession. As the researcher hypothesized that the majority of respondents would be natives of the Upper Peninsula, the question was phrased: "Were you raised in the Upper Peninsula?" The expectation was that the response would be indicative of where the subject was actually raised, and inference about rural/urban locus could be made. Provision was made to allow follow-up questions to gain specific responses to the rural/urban locus.

The second question in part one asked: "In what year did you earn the degree that allowed you to begin practicing as a(n) (engineer, lawyer, physician, teacher)?" The starting in the profession, rather than chronological age,

was expected to give a better indication of the length of time the subject had been engaged in the profession and had had the opportunity to gain professional continuing education experience. One purpose of this phrasing was to compensate for second profession and post-family-rearing professional entry of women.

The second portion of the interview schedule sought to establish whether the person was actively engaged in the profession and with what steadiness. The questions asked directly request information on current employment, differentiating between governmental, private company and self employment and non-employment or retirement. Work history and future expectations were also queried.

Part three of the schedule had questions that examine the stability and proclivity to participate in professional continuing education and attitudes toward and between types of instruction, comparing them to each other and to traditional "teacher in front of the classroom" class sessions and technology. The technology questions were planned to elicit information about comfort with an exposure to technical equipment such as videocassette recorders and computers and to the use of television, radio and the telephone.

In part three, questions about past practices in education were asked with queries: "Where did you earn your entry level professional degree?" and "Have you obtained any

other degrees or certifications?" Engineers were asked about professional or specialty certification rather than other degree or certification because it is more common for an engineer to mark advancement in the profession by passing certification testing than by gaining additional degrees.

The protocol continued gathering data about the subjects participation in professional continuing education and reasons for participation, if there were any. In order to assess the potential for professional continuing education via distance education means, the subject was asked a battery of questions about the availability of technology present in the home, at the worksite or in both locations. The questions were asked only after the types of programs were explained. The explanation preceded the questions to insure that the subjects were all sure about the meaning of terms with which they may not have been familiar. Questions explored the availability of television, video cassette players, computers, facsimile machines, satellite dish receivers and computer modems.

After examining the history of behaviors and the availability of means of participation in professional continuing education by distance education, the protocol asked the subjects to compare types of educational presentations using a scale of zero to ten to indicate level

of interest. The comparisons were designed to ferret out travel concerns, methods concerns and participation style concerns.

Travel concerns were examined with the question and answer sequence:

> I am going to list some types of ... locations for you. I want you to tell me, if study in your professional field were to become available in the next year using these formats, what your interest level would be. We'll use a scale of zero to 10, zero for no interest to ten meaning you'll sign up today to attend the course.
>
> a. A local campus course;
> b. A course at worksite;
> c. A course at home;
> d. A course at a center within driving distance (Ramada Inn);
> e. A course on a distant campus

The format of the course presentations were queried with the following response items which followed the lead questions requesting a zero through 10 evaluation:

f. A course by pencil and paper correspondence:
g. A course by videotape/canned television:
h. A course by computer:
i. A course by interactive television where you can call in questions;
j. A course with a live instructor in a classroom;
k. A course in a seminar setting with all students giving individual reports;
l. A course with other students with whom you work in groups.

Responses to these questions were compared with classroom instruction in another section of the protocol.

The last question in the section asked specifically if the subject participant had ever taken a course, at any level of education, formal or informal, by other than the

traditional "teacher and students in the classroom" means. If the subject had, the specifics of the type of course or courses and details were solicited.

The final section of the protocol asked the subject to make some choices between two categories of items. The forced choice items were:

> In this last question I'll ask you to make some preferences known by asking you to make choices between two categories. Please tell me which of the two you would prefer.
> comparison one:
>
> a. a course in a classroom with a teacher
> b. a pencil and paper correspondence course
>
> a. a course in a classroom with a teacher
> c. a video course that you can review as you need
>
> a: a course in a classroom with a teacher
> d. a computer course with teacher and other student interaction.
>
> comparison two:
> (a.) working individually or (b.) as part of a team or group
>
> comparison three
> (a.) a course by live television (called live interactive TV) where you can call in questions or (b.) a course by computer where you can also interact with others by keyboard
>
> comparison four
> (a.) a live interactive television course or (b.) a pencil and paper correspondence course
>
> comparison five
> (a.) a computer interactive course or (b.) a pencil and paper correspondence course

comparison six
(a.) a traditional classroom course at a distant site or (b.) a telecommunications course locally?

The final statement was a renewed "Thank you for participating in my study.", an offer for a copy of the results as debriefing, and a reminder of the researcher's local telephone number.

Throughout, the advice that "The order in which questions are asked can affect the responses as well as the overall data collection activity (Babbie, 1989, 147)." was considered as the guideline to question placement and flow.

Implementation

The study implementation was separated into three operational phases: the pretest of the instrument, the pilot test and the full-scale study.

The Pretest

The pretest phase was conducted for the very purposes cited in Borg and Gall (1983, 425).

> In addition to the preliminary check that you make of your questions in order to locate ambiguities, it is very desirable to carry out a thorough pretest of your questionnaire before using it in your study. For the pretest you should select a sample of individuals from a population similar to that from which you plan to draw your research subjects.

The researcher selected acquaintances who were not drawn in either the study or pilot study sample group from each of the populations of engineer, lawyer, physician, K-12 teacher and college professor. Those selected acquaintances were asked to review the questions, the phrasing and probable responses to the questions in light of the research objectives presented to them. Professionals in engineer, K-12 teacher, professor, lawyer and physician ranks were asked to assist in evaluation of the interview schedule. A letter (Appendix B) setting out the guidelines and questions for the reviewer was sent to each pre-test participant after confirming with a telephone call or face to face discussion with the professional his willingness to participate in the pretest phase of the study. The interview schedule as it was proposed (Appendix A) was included with several sheets of blank writing paper for response and a stamped return envelope.

From the responses of evaluations and suggestions, revisions were made to the interview schedule. Among the recommendations of the pretest group were:

1. Do not ask the age; ask question with a date of entry into the profession. Chronological age is not as critical a factor in determining participation in professional continuing education as length of time in practice.

2. Eliminate questions on marriage and children. The pretest group does not view marriage or number of children as relevant to need, desire or attitudes toward continued education for a number of reasons. By and large, the pretest reviewers feel these questions would serve to alienate respondents rather than collect any usable or valuable data.

3. The pretest group recommended rephrasing of work status questions to a more easily answered question series requiring only "yes" and "no" responses.

4. Questions about additional degrees, certification and registration as qualifiers beyond entry level requirements differ by profession and entry level requirement and certification maintenance requirements. The pretest group suggested a more generic and slightly rephrased question for each profession.

5. The pretest group also recommended a revised introduction to the course presentation style and location questions. The questions were revised, grouped differently, placed differently within the group and were equipped with a zero to ten scale on the panel's advice.

Questions about presentation preference repeated some of the options in the location/presentation style section as an internal validity check. It forced choices between two categories of course presentation types.

Some of the pretest participants specifically recommended questions they thought it good to get answers to for their particular profession or for their own specific interest. While these questions and the areas of concern and interest they raised were considered, none of the suggestions appeared applicable across all professions and none of the profession-specific questions were added to the interview schedule.

The revised interview schedule was then prepared. During the pilot study phase the exact wording of the questions was explored and adjusted to enhance clarity and understanding of the question by the subjects. The resultant answers were similarly reworked.

Generally, the results of the pretest reviews of the questions provided clear divisions within the answers for the subjects, expanded the choices isolating facets and clarifying issues, allowed the subjects to focus on each element, and sequenced the questions in a pattern that would be familiar to the respondents of the professions. Alternative wordings and possible answers were suggested with some populations and it was decided to include the genre of the profession in qualifying the answer.

Validity of the Instrument

Validity refers to the extent to which the interview schedule does what it claims to do. Researchers consider five types of validity in evaluating measurement instruments (Borg & Gall 1983).

1. Face Validity. Does the instrument "look right" to the respondents as a hedge against introduction of bias?

The pretest group helped set the arrangement of the interview schedule and ordered questions in such a way that it would "look right" to members of their professions. The researcher combined the recommendations into a cohesive document.

2. Content Validity. Does the instrument cover content appropriate to the research study, the samples, and to the population to be studied?

Again, the pretest group assessment provided affirmation of the content validity which was further assessed in the pilot study.

3. Predictive Validity. Does the document measure the extent to which the performance or behavior of the subject conforms to the performance or behavior predicted by the instrument?

There was no intent in the present study to extend or predict the future behavior of the subjects. The descriptive nature of the study rather examined "what is."

4. Concurrent Validity. Is there a correlation between the scores on the instrument and those on a known or criterion measure?

No attempt was made to establish concurrent validity by administration of another instrument. It is suggested, however, that the administration of the Participation Reasons Scale instrument created by Grotelueschen and Caulley (1977) would provide an established measure for use as a criterion measure. Findings noted in Chapter II can be compared with findings in the present study as an initial validation step.

5. Construct Validity. Does the instrument actually measure a theoretical construct it purports to measure as an explanation of the causes of behaviors and is the instrument in alignment with theory and methods which exist in the area?

Schuman and Presser (1981) presented the fundamental guidelines for interview construction and question placement in attitude research and provided a guide for preparation of the interview schedule used in this study.

The Pilot Test

The pilot study was undertaken only after consideration of advice from Babbie (1973):

> Often a sample design may seem reasonable on paper, only to prove unmanageable in practice. If the design calls for the creation of a sampling frame, a portion of that frame might be created in a pre-test (p. 205).
>
> If the researcher will be selecting his sample from an existing list, he should carefully scrutinize the list for problems. If stratification is intended, he should make a trial run of the stratification procedure (205-206).

After the sample populations had been sifted to assure that those in the sample would be a sufficient number for the study, the next series of randomly selected subjects was used as a pilot study sample. Again the researcher heeded the advice of Babbie (1973):

> ...a pilot study should be directed at a representative sample of the target population. The pilot-study sample, then, should be selected in exactly the same fashion as is intended for the final survey. One exception may be entered in this regard, however. Since the researcher may wish to avoid studying the same respondents in both the pilot study and the final survey, he may wish to select both samples at the same time as insurance against the possibility. This may be accomplished in one of two ways. First, the researcher may select his final sample ... and then select a pilot-study sample from the remainder of the population. Or he might select an initial sample containing enough elements for both and subsample from that list for his pilot study (211).

Once the populations were isolated, the researcher selected the sample for the study and continued to select using the same procedure to accrue a large enough sample for

the pilot study. In both the pilot study sample and the main study sample, care was exercised to oversample to allow for replacement of subjects that had moved or who did not respond to their telephones after repeated calls.

The study then continued by following this strong admonition:

> A preliminary trial of research measures and techniques is essential to the development of a sound research plan. Whenever possible this preliminary trial should be enlarged into a pilot study. In a pilot study the entire research procedure is carried out, including analysis of the data collected, following closely the procedures planned for the main study. Pilot studies are carried out with fewer subjects than will be employed in the main study. For some pilot studies two or three subjects are sufficient, and it is rarely necessary to include more than twenty subjects (Borg & Gall 1983, 100).

The pilot test consisted of a proportional sampling of 21: 3 engineers, 2 lawyers, 2 physicians, 8 K-12 teachers, 4 professors. The individual subjects were randomly selected (using the sample selected initially during which the study sample was selected first and the pilot study sample selected after to avoid duplication). Replacement was necessary in two cases where the originally selected subject had moved from the area. The replacement was made from the oversampling contingency group.

The actual participants in the pilot study included: 3 male engineers, one male lawyer, 2 male physicians, 5 male K-12 teachers and 3 female K-12 teachers, 1 female professor and 3 male professors.

With the figures gained from the pilot test as a basis (indicating an interest in professional continuing education by a sizable percentage of each professional group, even those with a mean practicing time in excess of 20 years), it appeared that the complete study was viable and valuable information about attitudes and behaviors toward professional continuing education and distance education could be discovered.

The researcher determined during the pilot study interviews that further revision and adjustment of questions was necessary. Final adjustments in the Interview Schedule were implemented and the final schedule generated and used for all of the study sample interviews (Appendix C). A tally sheet was used with the interview schedule for recording responses (Appendix D).

When the researcher used the interview schedule, he used transition phrases to allow a flow from one question to the next. He was as responsive to the subject as possible without suggesting any bias and without giving direction to respondents.

The area in which respondents had greatest difficulty gaining focus was in questions about "study in your professional field." A number of subjects requested course names, instructor names, course length or cost information to assist them in their answers. The researcher only

repeated the phrase, "study in your professional field" and suggested the subject was more qualified to envision what the study would be like than was the interviewer.

The Study

After the sample was selected, the names of the subjects and notations about their addresses and professions were listed on tally sheets (Appendix D) and the telephone listings for Marquette County were consulted for numbers for each subject.

Telephone interviews for the study were conducted during a two-week period in May, 1992. In the case of many of the female K-12 teachers, calls were made to the offices of the schools where the teachers were employed. The researcher made arrangements with office staff to conduct interviews during teacher preparation time or for the teacher to return the researcher's call.

When both office and home telephone numbers were listed for the subjects, calls were made first to the business location during the morning hours and then to the home numbers.

During the six to 10 minutes that each interview lasted the interviewer asked questions, made clarifications, and noted responses on the tally sheets. When the 100

interviews were completed, the resultant data were entered into Minitab (1991) statistical software for computer analysis.

The researcher used an eleven point scale (0-10) for measuring the level of interest in course presentation formats. The placement of responders into general areas allowed the researcher to collapse the scale to a five point scale for presentation and graphing.

In summary, the planning and preparation of the questionnaire, the pretest and pilot study led to the implementation of the complete study. The goals were to test the instrument with a pilot group, survey the sample and record responses. These goals were achieved when the 100 interviews were completed.

Ten of the randomly selected subjects refused to participate and were replaced. One engineer refused giving no reason, two lawyers indicated they did not have time to respond to a survey, two physicians also pleaded no time to respond. Two teachers in a parochial school were told by their principal to not respond, one in a public school was unwilling to participate, another teacher did not have time. One professor responded that he never participated in telephone surveys.

Data Analysis Procedures

The final stage of the research procedure was the explanation of the analysis of the data gathered.

"Since the data gathered were quantified, the findings were displayed using descriptive statistics and charts (Cates 1985, 98; Davis 1971, 3)."

The data were set out in (1.) numerical frequency, (2.) in percent tables for the descriptive presentation, (3.) and through tables in the descriptive analysis. Descriptive statistical techniques (also known as summary statistics) were used to describe data collected on a research sample. The data collected were both ordinal and nominal in nature.

Measures of the central tendency, mean, median and mode were calculated within and between the subgroup samples and the total of the samples. The dispersion of the results as calculated by range were also shown (Best & Kahn 1989).

The data assayed out to be nominal and ordinal (categorical) in nature, but the basic tenets of even distribution and quantity were not provided for invoking the more advanced statistical analyses. Consequently, the researcher turned to a procedure suggested in Fink and Kosecoff (1985) which assesses the relative interest levels of the members of each of the subpopulations (in the current study the members of the professions) in the pursuit of continuing professional education.

Summary

The processes of the study, from construction of the original interview schedule and tally sheet which appear in Appendix A, through the pretest and pilot study were preparation for the final interviews.

Using the revised Interview Schedule (Appendix C), the researcher called 100 respondents to elicit data which were recorded on a tally sheet (Appendix D). The data , with the help of the Code List in Appendix E, were later transferred to compilation sheets for data analysis. Permissions and research statements included in the Interview Schedule were approved by the University Committee on Research Involving Human Subjects. A copy of the letter of approval is reproduced in Appendix F.

In the Chapter IV, analyses of the results of the research are presented.

CHAPTER IV

DATA ANALYSIS

This chapter is a presentation of the analysis of data collected from the survey instrument and procedures described in Chapter III. This chapter is divided into five sections. The first section reports the demographic and professional characteristics of the respondents and the stratification of the sample. The second section examines projected professional continuing education practices. The third section examines distance education media availability. The fourth section reviews attitudes toward professional continuing education by distance education means. The final section summarizes the results.

Most statistical procedures and methods are predicated on two major assumptions: first, it is assumed that the data relate to interval or ratio scales (rather than to ranks or categories); and second, it is assumed that scores are sampled from populations that are at least approximately normally distributed (Nunnally 1975 281).

In the current study the majority of scores are nominal and ordinal scale values and because of the clustering of the data for all five populations at one mode, there is not an assumption that the populations are normally completed. The demographic and professional characteristics of the population are contained in Appendix G.

Projected Professional Continuing Education Practices

Before examining the attitudes toward future offerings of professional continuing education the study examined current and past practice toward additional learning.

TABLE 6 shows the extent to which professionals in each of the groups pursued continuing education beyond the entry level degree. One can note that in the professions where a "terminal" degree is required for entry into the profession there is little participation for the purposes of further degree attainment. For both engineers and K-12 teachers there is entry into the profession with a basic Bachelor's Degree. Teachers are likely to work to attain a Master's Degree or hours beyond. In the A/D column are noted those who chose to choose another degree field in which to complete a degree.

Among the sample population, as illustrated in TABLE 6, members of the professions where professional continuing education has been required have been more likely to seek additional study. In those professions where it has not (engineers, lawyers and professors), there is less evidence of "formal" professional continuing education pursuits.

Not all professionals are required by law to pursue professional continuing education activities during their working lives. Some must meet State of Michigan mandates for only a portion of their professional lives. Still others must continue to participate in professional continuing education as long as they are practicing professionals.

Five of the engineers sampled had not pursued additional credentials, six had achieved Registered Engineer credentials and three had attained degrees (A/D) in other fields; business or teaching. None of the lawyers in the sample had attained fdurther credentials. Physicians in the sample had all gained additional credentials in a specialty area.

K-12 teachers progressed through academic ranks of added hours (to meet requirements), the Master's Degree, hour beyond the Masters, or to another degree (usually special education) or business certification. Professors who entered the profession with less than a Ph.D. had

worked toward a Master's Degree. Six of those who entered their field with a Ph.D. had worked toward certification in other areas, usually professional organization certification (Certified Public Accountant, Architecht).

TABLE 6. Extent of Professional Continuing Education by Profession

Profession	None	Hrs	M.S.	M.S.+	Reg	A/D	OTR
Engineer	5		1		6	3	1
Lawyer	6						
Physician							9
K-12 Teach	7	8	10	13		8	2
Professors	9	2	2		1		6
Totals	27	10	13	13	7	11	18

There is no requirement that an engineer gain any additional education beyond the entry level Bachelor's Degree. The State of Michigan does have a professional registration available. The professional engineer is one who has demonstrated a "knowledge of mathematics, the physical sciences, and the principles of engineering, acquired by professional education and practical experience" (Michigan Public Acts of 1970). The professional engineer examination is given by a state board. Requirements for the examination include citizenship in the state, good moral character, attainment

of the age of 21, and practical experience of no less than 8 years under the direction or supervision of a registered professional engineer, and to be a graduate in engineering from an engineering college or school and with not less than 4 years of experience of a nature satisfactory to the board.

The requirements were stiffened in 1977 when applicants were required to have a baccalaureate degree or equivalent education. The examination is given at least annually by the examination and certification board (Public Act No. 20 1970).

There has also been no requirement for lawyers to continue in education once they pass or are accepted to the state bar. The state bar of Michigan consists of "all persons who are now and hereafter licensed to practice law in this state" (Public Act 118 1967). Admission to the bar can come via the supreme court or circuit court upon presentation of evidence of possession of the required qualifications. Applicants must prove to the examining board that they are of "good moral character, 18 years of age or older, a resident of 1 of the states ...,has the required general education, learning in the law, and fitness and ability ... and that he or she intends in good faith to practice or teach law in this state" (P.A. 118

1987 Section 600.934). The applicant can prove qualification of education by passing the multistate bar exam.

Under the Michigan Court Rules (West 1992) currently in effect, any attorney licensed to practice law after January 1, 1990, must complete "a program of continuing legal education as provided in this rule" (West 1992 1096). Lawyers licensed after that date must complete 12 hours of continuing legal education by March 31 of each year for the first three years of professional practice or bar membership.

K-12 teachers have been required by law to continue their educational pursuits for a number of years. Teachers have been required to enter the profession on the basis of a state provisional certificate. On the basis of that certificate the qualified person shall complete three successful years of teaching and 30 hours of graduate study within five years of the date of the provisional certificate to gain a continuing license (certificate) to instruct at the K-12 level (Michigan Administrative Rules 1965). Beginning September 1, 1991, the state board of education issued teaching certificates only to those who have passed both a basic skills examination and a subject area examination in the area in which he or she is to be certified.

Physicians, who are governed by the state Public Health Code, must meet age and moral character standards and also have "a specific education or experience in the health profession or in a subfield or specialty field of a health profession ... (Michigan Public Health Code 1978).

Physicians are required by the Public Health Code to renew their license every three years. They must provide "evidence that during the 3 years before application for renewal the licensee has attended continuing education courses or programs approved by the board totaling not less than 150 hours in subjects related to the practice of medicine including medical ethics and designed to further educate licensees" (Public Health Code Section 333).

College professors usually need only meet an entry level requirement of a Bachelor's Degree for initial employment, but most work toward a Master's Degree or doctorate. Because Northern Michigan University employs specialists in vocations as instructors, there is a handful of non-bachelor degree instructors at the vocational center. There are no state mandated requirements for professors to continue education beyond their entry level degree.

In TABLE 7 the randomly selected sample indicates a longevity in the professions. One engineer has had a 42 year professional life, and in other professions the mid to upper 30 year range is common. The mean time spent as

a professional by those in the sample centers on 20 years, with engineers and college professors attaining a greater mean and lawyers and K-12 teachers having lesser means. Though the mean times in the professions are near 20 years, there are those in the sample that have entered the profession in the last 2 years.

All of the respondents were asked to consider professional continuing education as offerings which would become available in the next year. They were then asked to consider the format and location of the offerings and to scale their level of interest level on a scale of zero to ten, with zero meaning no interest and ten meaning a certainty of signing up for a program. Variables were realms of location, presentation type and student participation type.

The mean number of years of employment in the professions exhibited by the respondents to the survey ranged from a mean of 17 years for lawyers to a mean of 26 years for engineers; but the clustering of the mean years of practice at approximately the twenty year mark showed an unexpected consistency. The range of years employed fdor all of the groups was from under ten to over thirty.

The percentage of professionals sampled that had been involved in further education (F/E) after entering their professions ranged from 57 per cent of professors to one

hundred per cent of physicians. Sixty seven per cent of lawyers and engineers had done some further study, 88 per cent of K-12 teachers had.

TABLE 7. Years of Experience by Profession and Further or Distance Education Experience

Profession	n	MEAN*	MIN	MAX	F/E*	D/E*
Engineer	15	26	5	42	.67	.60
Lawyer	6	17	8	39	.67	.83
Physician	9	20	6	33	1.00	.44
K-12 Teach	48	18	2	36	.88	.73
Professors	21	23	4	36	.57	.76

*The calculated mean number of years employment in the profession, the proportion involved in Further Education and Distance Education are calculated values.

TABLE 7 also indicates that physicians are the group most sure to have participated in continuing professional education , K-12 teachers are next most likely, then engineers and lawyers, and lastly professors. When examining the probability of having engaged in a distance education or non-traditional class, it is the lawyers who are most likely and the physicians who feel least likely to have engaged in a non-traditional class.

The subpopulations generally distributed themselves along the continuum in the same fashion. The most homogeneous displays combine engineers, lawyers,

physicians, and to a lesser extent K-12 teachers and professors. When there is a discrepancy in the participation or anticipation of participation, the largest variation from the sample is within the professor population.

FIGURE 2 shows the combined interest of the sample all five professions toward taking a course in their professional field if it were offered on a local campus. The respondents were asked to rank their preferences for course types and locations on an eleven point scale. The researcher desired the length of scale for the pu4rpose of avoiding the clustering around a mid score as is sometimes experienced with five point scales.

After the responses were tablulated, the scale was compressed to a five point scale fdor presentation. Interest levels expressed ranged from a low of one (1) (indicating non-interest) in the figures to a response of five (5) (indicating a certainty of participation in such an offering in the subject's professional field). Responses of two (2) indicate some interest; responses of three (3) indicate indecision and responses of four (4) indicate great interest but less than a certainty of participation. The figures show the combined interest or non interest of respondents.

While the high acceptance level, 4 on a scale of 1-5, holds for the total population, both engineers and lawyers are a little skeptical about the probability and therefore have expectations and attitudes that keep them from complete commitments. Such is also the case with professors. The highest complete acceptance response is from among the K-12 teachers, most of whom gained some of their prior education from Northern Michigan University, the local campus for the Marquette County, Michigan area.

The highest rating of support, as indicated in FIGURE 3, for a course at one's worksite as a method of professional continuing education was expressed by K-12 teachers and engineers. Both samples indicated that specialized training for specific goals could best be reached with that type of training. Short term goal oriented instruction was common in both professions. For teachers there was some desire that the training would take place during the regular work day.

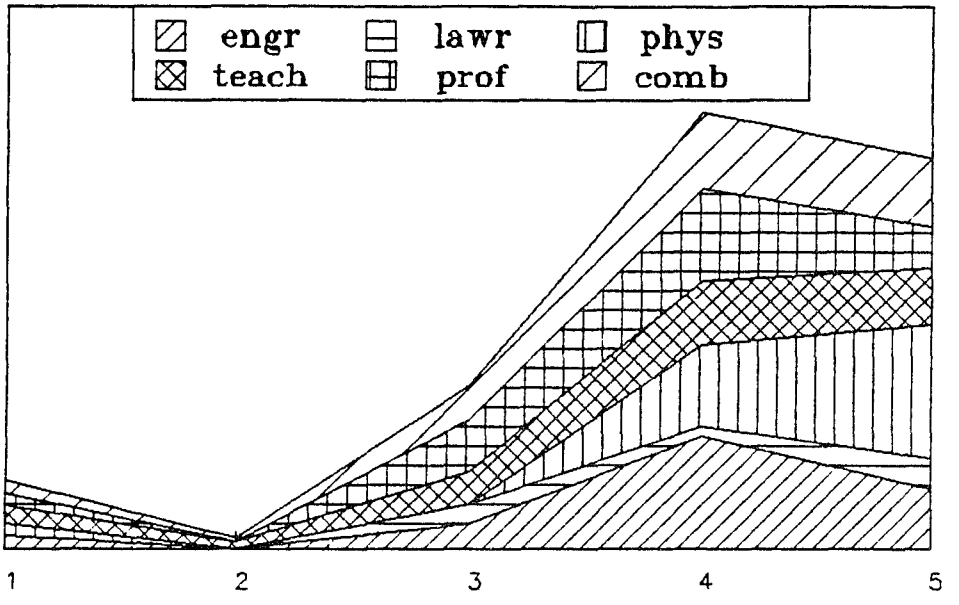

FIGURE 2. Interest in a Course on a Local Campus

In FIGURE 4 one can see a greater dispersion of reactions from the various subpopulations. The entire sample population rates a course at home as of high interest on the 1-5 scale, but there is a secondary mode at 3 indicating a significant ambivalence. Lawyers are most likely to be almost sure to take the course and account for the peak at four, physicians are the most indicisive group, choosing to wait and see what the speific offering would before commiting. They contribute most to the the 3 peak. Thus, the combined rating is very high.

Engineers are somewhat more likely to give greater support thand to be undecided; K-12 teachers and physicians als are somewhat indecisive to positive in responses. There was less indecision with the engineer population than in that of teachers and physicians about the desire for a course at home.

FIGURE 5 shows that the almost the entire K-12 teacher sample, the largest subpopulation, bolsters the peak of the interest in taking a course at a center within driving distance by rating it a 4. Lawyers and engineers are also likely to participate in such a program.

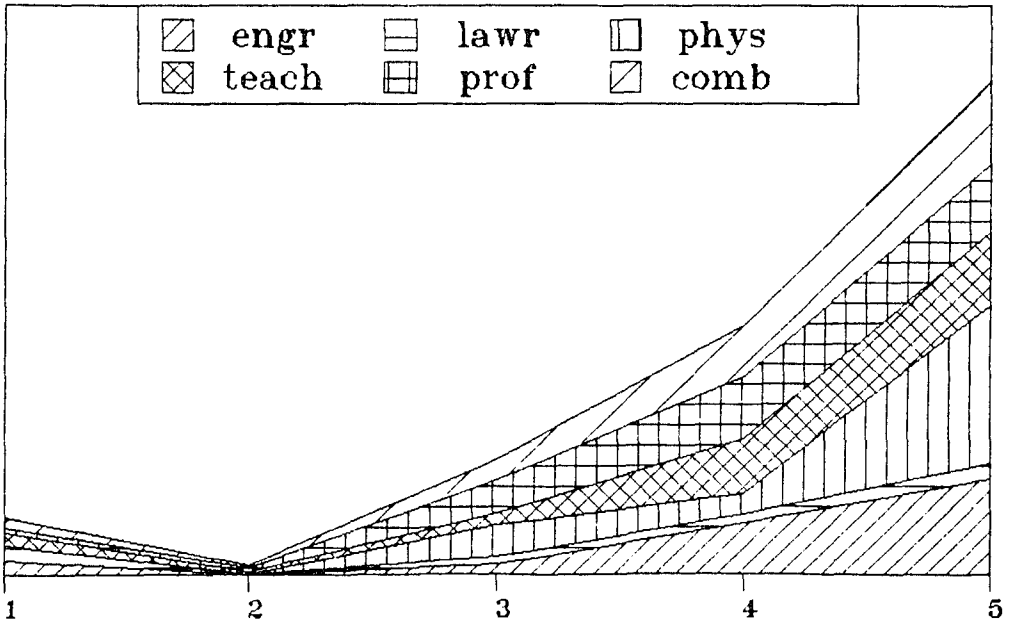

FIGURE 3. Interest in a Course at Worksite

The appeal of a course on a distant campus in indicated in FIGURE 6. Engineers, teachers and professors are less likely (by the 1 score indications) to participate if there is travel involved. The peak on the chart is in the 3 (undecided) area, indicating less chance of involvement, except in the case of physicians who are most

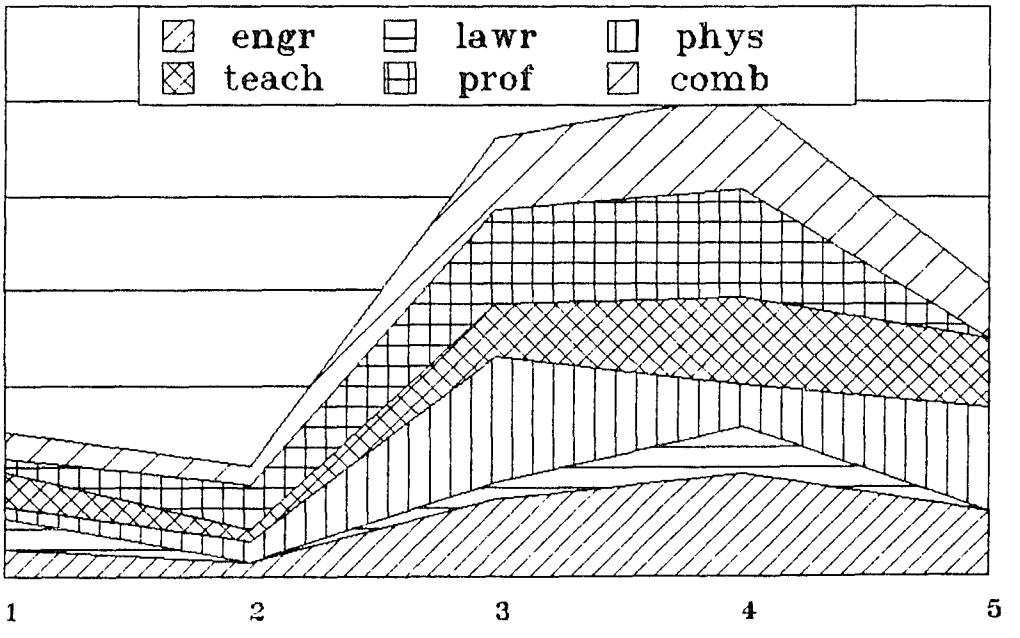

FIGURE 4. Interest in a Course at Home

likely to participate in a course at a distant site. Doctors indicated that they have been in the practice of traveling to gain special expertise and experience and would continue to do so.

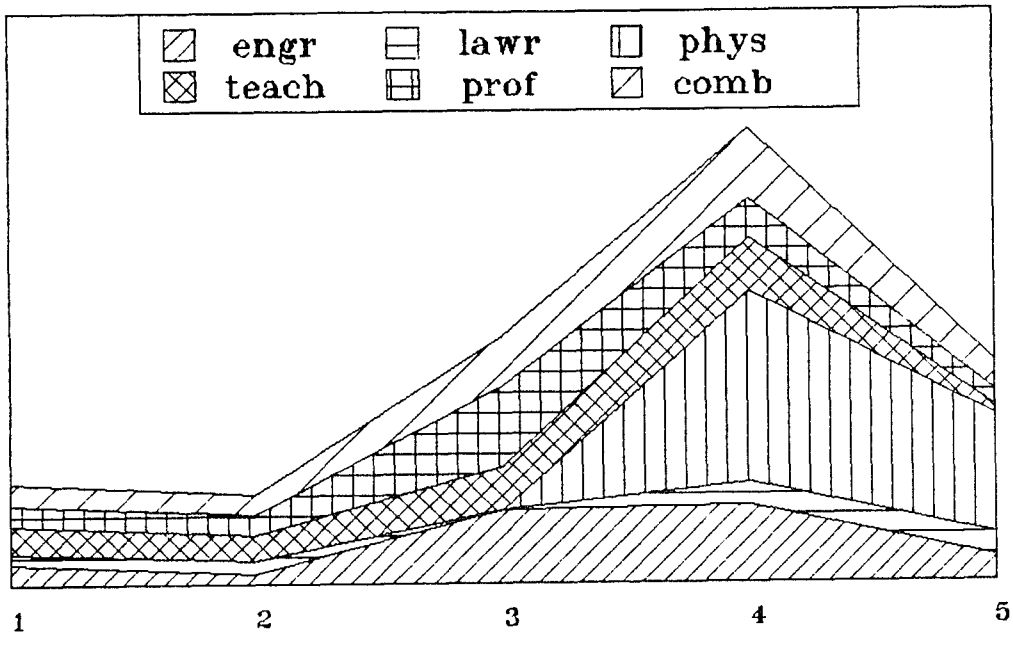

FIGURE 5. Interest in a Course at Center within Driving Distance

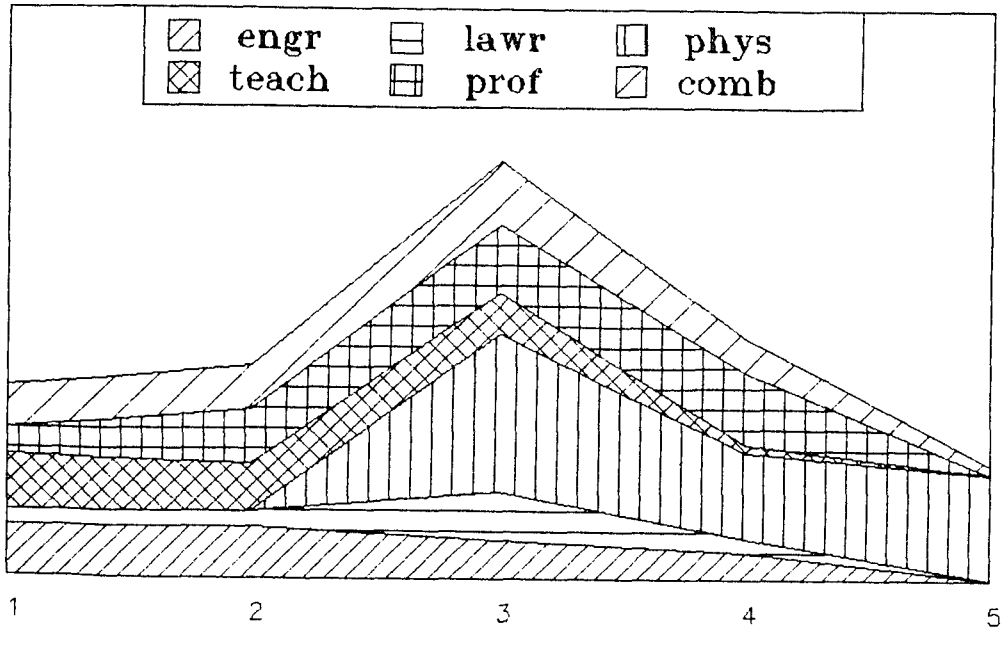

FIGURE 6. Interest in a Course on a Distant Campus

When asked about the type of courses in which they have an interest, the professions showed disparity of reaction arising from their perceived special needs and the differences in their own desires and expectations from any course of study. Generally, they expressed more disinterest in the pencil and paper course than in others. As FIGURE 7 shows, a pencil and paper correspondence course was not completely without merit as the total population mode was a 3, midrange. Engineers and professors ranked it lower, lawyers, physicians and K-12 teachers in the sample also had negative responses but indicated a sizeable number would be interested in seeing the specific offering before making a decision. Participants in all of the professions indicated an acquaintance with correspondence courses.

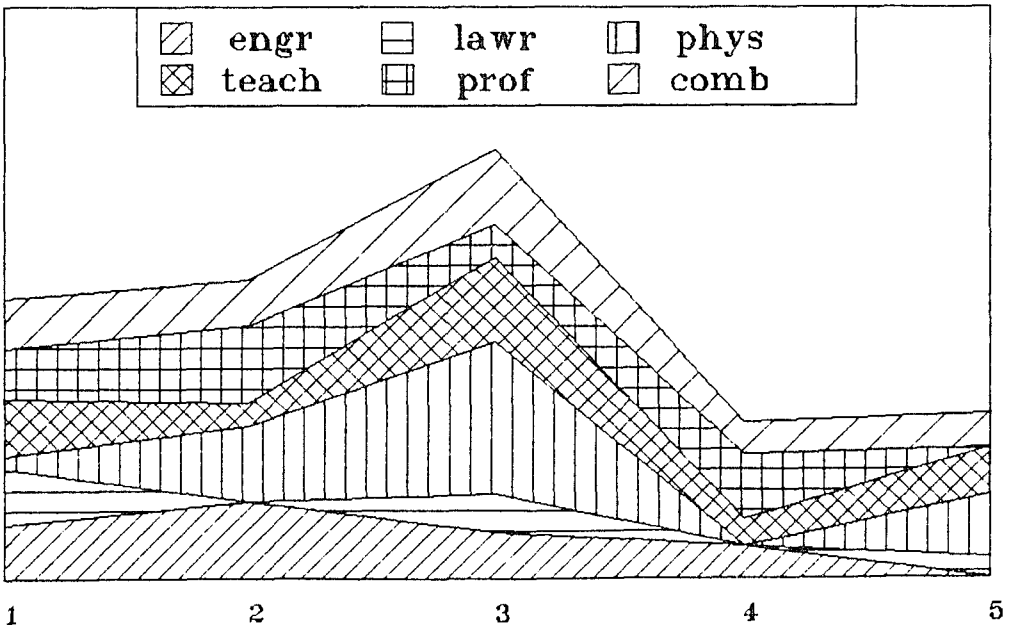

FIGURE 7. Interest in a Course by Pencil and Paper Correspondence

Videotape and television courses rated higher with physicians than with other groups, reaching a peak at 4 and 5, showing great favor for this type of course. Engineers and professors were most undecided and showed a peak at 3 and K-12 teachers were interested though there

was a desire to see the specific offering before making a commitment. As FIGURE 8 shows, the middle levels of interest for a technology which almost every member of the sample population possesses may indicate the use of the technology.

Though fewer people had access to computers, FIGURE 9 indicates the same 3,4 (indecision to interest) peak in the attitude toward involvement in taking a professional continuing education course by use of the computer. There is also a sizable population element which is least interested in taking the course by computer. Engineers, teachers and professors form the high interest group, while physicians and lawyers are the greatest non-interest groups.

Interactive television provoked a high level of interest among all subpopulations as indicated in Figure 10. The peak at 4 is shared by engineers, lawyers, physicians, K-12 teachers and professors alike. Engineers and physicians evidence significant support at the 5 level also.

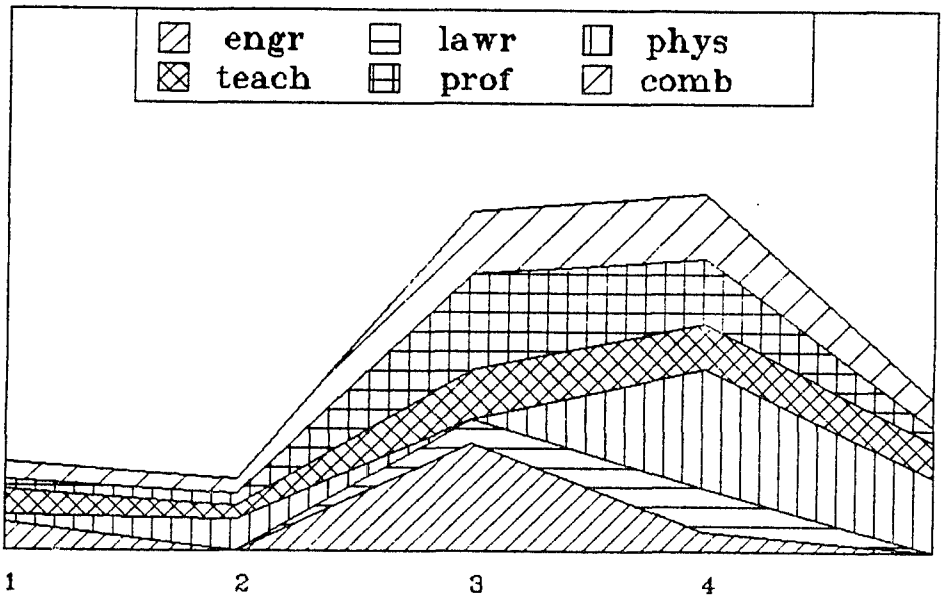

FIGURE 8. Interest in a Course by Videotape and Television

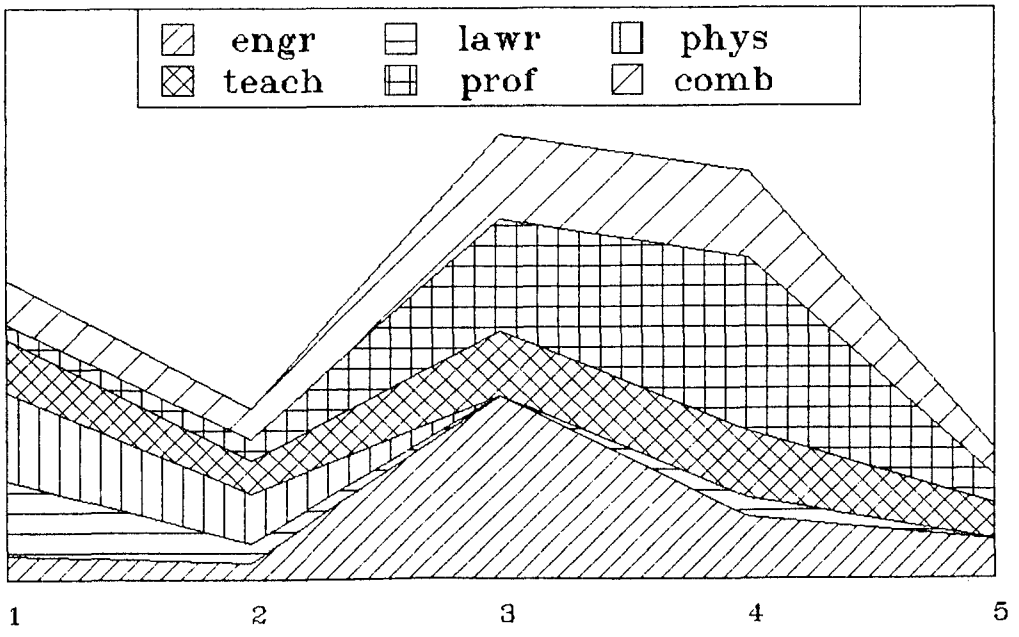

FIGURE 9. Interest in a Course by Computer

Though the other formats for delivery of a course enjoy high levels of reported interest, no technique other than a course by a live instructor in a classroom, as illustrated in FIGURE 11, was ranked as the most favored method by the entire population as a whole. That is not to say that all sectors ranked it the highest, as both engineers and lawyers rate it high interest. The numbers in the K-12 teacher population, the physician population support, and the skewed professor support for the teacher in the classroom presentation pattern made this the highest rated form of instruction. In noting this one also needs to note that the mean number of years of employment in the profession for those professionals in the random sample used was approximately 20 years. There may be some correlation of preferred type of course presentation with experience of the group.

In examining student participation in the proposed course offerings, two types of involvement were investigated. The seminar course with individual presentation and the seminar course with group work and involvement were assessed. While a number of respondents spoke extensively of their high level of approval for both methods, the individual report had a peak response of 4 (high interest and possible participation) for all five of

the sub populations while the group presentation and participation question had response peaks of 3 or 4 (showing more indecisiveness), in the upper middle range.

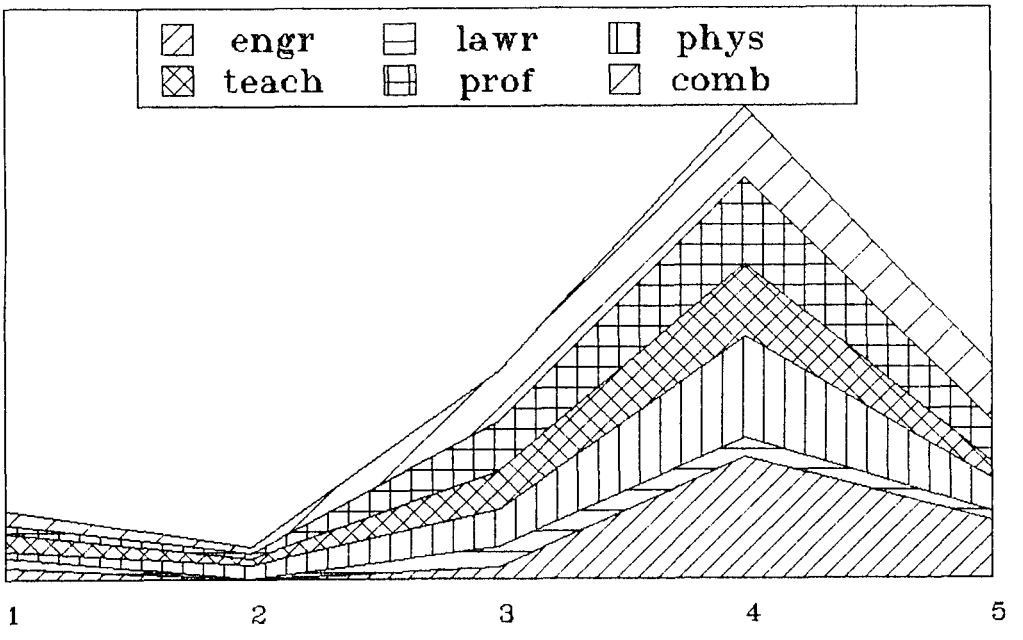

FIGURE 10. Interest in a Course by Interactive Television

The showing of indecision were reflected more by the sample of engineers, K-12 teachers, lawyers and physicians while professor responses expressed high preference for group presentations. The 1 (non interest) response levels were similar for all of the groups for both of the questions. The individual report responses are illustrated in FIGURE 12, the group participation in FIGURE 13.

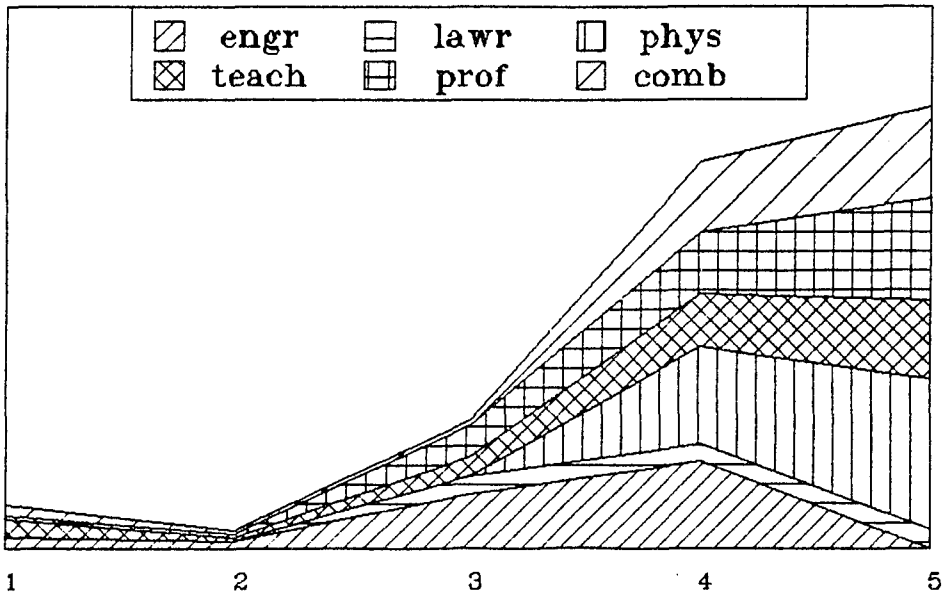

FIGURE 11. Interest in a Course with a Live Instructor in a Classroom

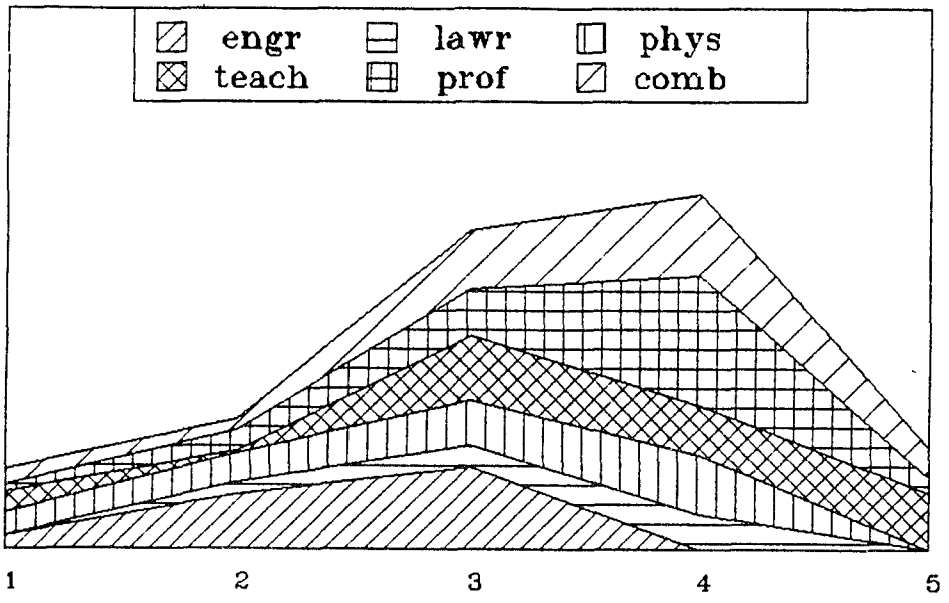

FIGURE 12. Interest in a Seminar Course with Individual Reports

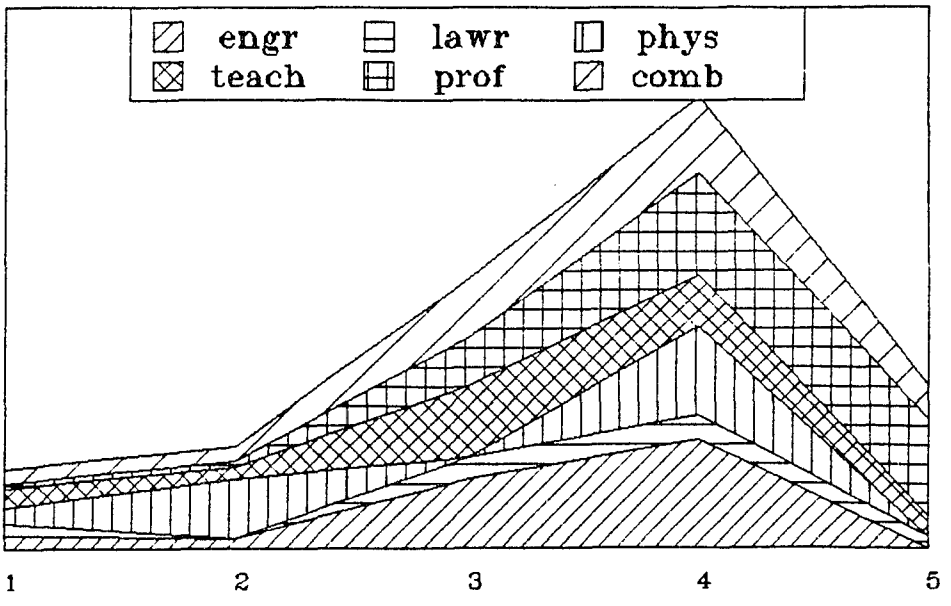

FIGURE 13. Interest in a Seminar Course with Group Participation

Availability of Distance Education Media

Physicians and lawyers among the professionals have more access to the hardware of distance education than do professors, K-12 teachers, or engineers. The following tables show the degree of availability of necessary media, and the loci where the media is available.

The descriptive statistic most often used to relate groups when comparing data is the mode. "The mode--the only measure of central tendency available when observations represent nominal scale data (Schmidt 1975 81)." This will not be done here since the preponderance of data indicates the universal availability of television, the videocassette recorder, and in some professions the computer, the modem and the facsimile machine.

Virtually all of the professionals have television and videocassette machines available to them at work, at home, or in both places. As TABLE 8 indicates, with only three exceptions, the entire sample group had both television and videocassette equipment available.

Lawyers and physicians have facsimile (fax) machines available for their use in all cases of the interview sample; 80 percent of engineers and 70 percent of professors also have the machines available for use. As TABLE 9 indicates, computers are almost universally available with 88 percent of the sample (88 by count)

having them, though not one professional group sample was entirely equipped. Of those with computers, 58 per cent had modems available for communications. The largest variance between computer and modem ownership was in the K-12 teacher group where 43 teachers had access to computers but only 15 (or 35 percent) had access to modems.

TABLE 8. Television Media Availability

Profession	Television	VCR	SAT DISH
Engineer	14 of 15	14 of 15	2 of 15
Lawyer	6 of 6	6 of 6	0 of 6
Physician	9 of 9	9 of 9	2 of 9
K-12 Teach	48 of 48	48 of 48	4 of 48
Professors	21 of 21	20 of 21	7 of 21

TABLE 9. Other Electronic Media Availability

Profession	COMPUTER	MODEM	FAX
Engineer	13 of 15	8 of 15	12 of 15
Lawyer	5 of 6	5 of 6	6 of 6
Physician	8 of 9	7 of 9	9 of 9
K-12 Teach	43 of 48	15 of 48	16 of 48
Professors	19 of 21	16 of 21	15 of 21

The task with the rest of the survey is to calculate the proper measurements. Alreck and Settle (1985, 381) say, "To choose the proper statistical tool to measure a relationship between two items, the researcher must only determine two things: what type of variable is each item and which item will be viewed as 'dependent' and which as 'independent'". The dependent variable is the one being caused or affected, and the independent variable is the one causing or affecting the other.

In examining the differences in availability of the tools of distance education to the members of the samples of the professions, one must turn to TABLE 9 to see the comparison.

It is noted that of the 99 in the survey sample, 98 have a television available, 73 have one at work and at home. Ninety-seven of the sample have videocassette (VCR) recorders available, 78 of them both at work and at home. There are 88 with access to computers, 48 of them at both work and at home. Fifty-one have modems, 19 at both home and work and 29 at work only. Only three have modems only at home and not at work. Fifty-eight of the sample have facsimile machines, 52 at work only, 5 at both work and home.

The technology in short supply is the satellite dish. This is available to only 15 of the 99 sample members: 5 at home, 8 at work, and available to 2 in both places.

Attitudes toward PCE by Distance Means

In making comparisons the researcher found such skewed responses to most questions requiring a choice between two methods of instruction, class offering or participation that the clearest method of presentation was deemed to be bar graphs. All scales are based on a zero to 1 score with each subpopulation group equated to 1. The relative proportions of each group, and the proportion of all the subpopulations members grouped together are presented in FIGURE 14 through FIGURE 21.

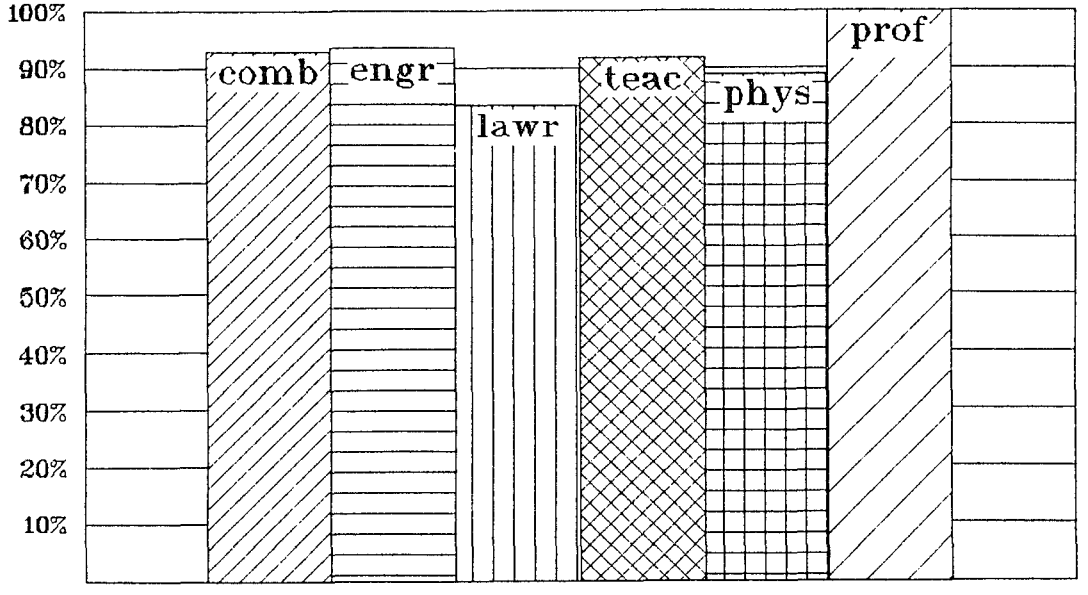

FIGURE 14. Preference for Teacher in Classroom over Correspondence

When asked to choose between a course offered by a teacher in a classroom or a pencil and paper correspondence course with which they could structure their own work hours almost the entirety of each group selected the teacher in the classroom. Only lawyers dropped much below a 90 percent preference of the teacher as FIGURE 14 illustrates.

In most cases the teacher in the classroom was favored over a video with review at will. As a group, lawyers did not indicate a preference for either the teacher in the classroom or the videotape, coming up evenly divided in the sample. Lawyers in the sample indicated that much of their training was already gained by video tapes about trial presentations and current changes in procedures and that they felt very comfortable with that.

Physicians in the sample were only slightly more likely to prefer the instructor in the classroom. Physicians also indicated a wider experience with video presentations, particularly in instruction in surgical procedures and in presentations by drug firms.

There was about a 7 to 3 preference for the instructor in the classroom over the video with review at will in the populations of engineer professor and K-12 teacher, and in the population as a whole as FIGURE 15 illustrates.

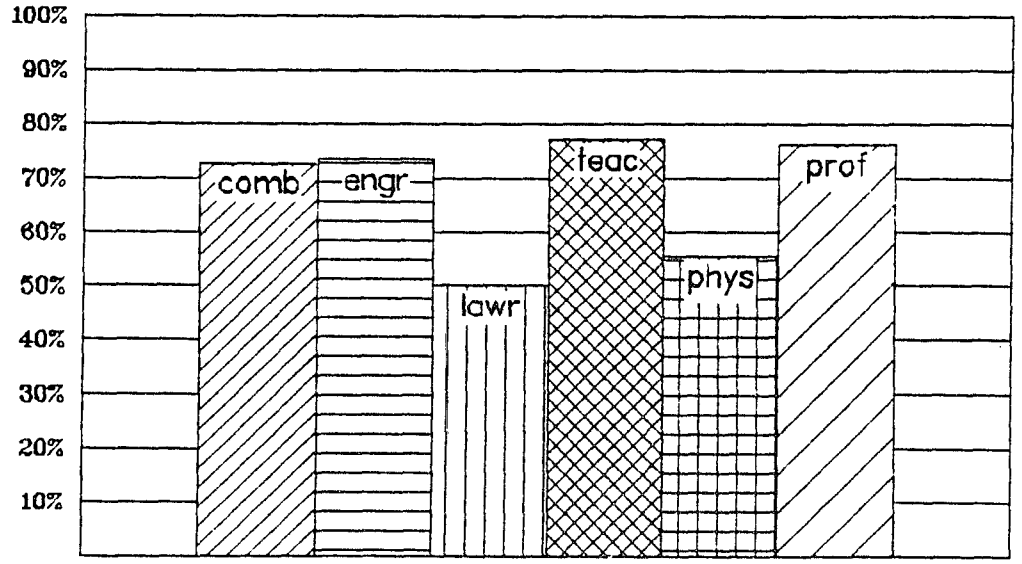

FIGURE 15. Preference for Teacher in Classroom over Video with Review

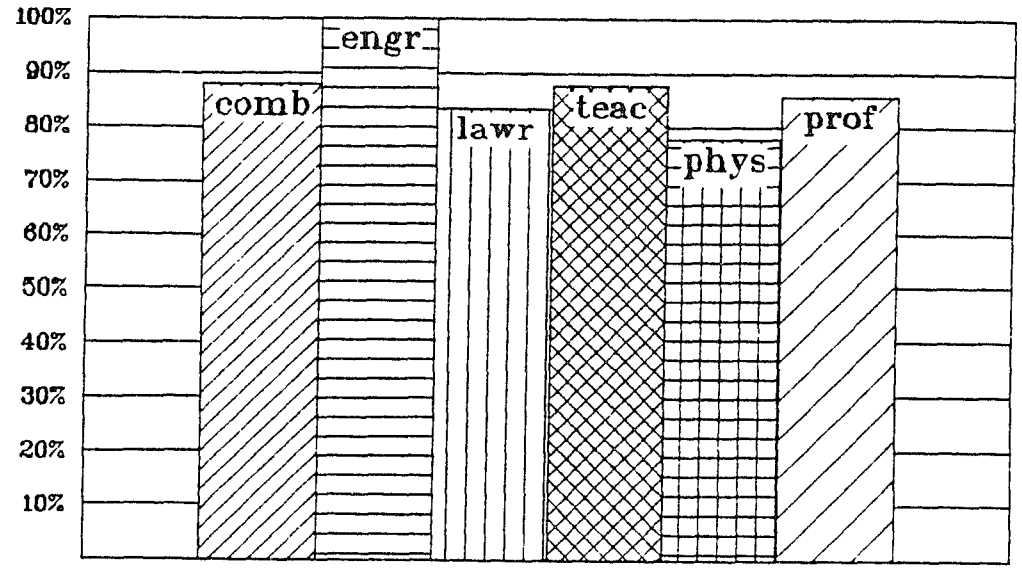

FIGURE 16. Preference for Teacher in Classroom over Computer Interactive

When given a choice between taking a class or program in a classroom with a teacher and taking the same program via a computer in an interactive mode, the subpopulations favored the classroom teacher by about 8 to 2 or an 80 percent preference.

FIGURE 16 shows that all of the engineer sample preferred the teacher, and all others (except physicians) have over an 80 percent preference for the teacher. Physicians prefer the teacher in the classroom by just a shade under 80 percent of the sample population.

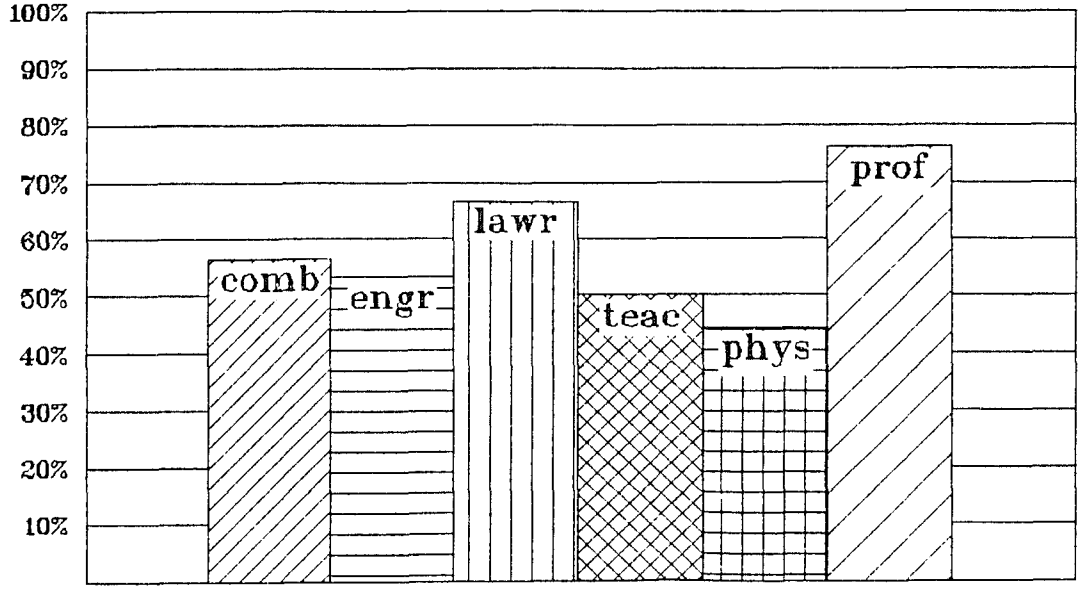

FIGURE 17. Preference for Working Individually over Working as Part of a Team

While both working as an individual in a course and working as part of a group got high ratings when asked as solo questions (see FIGURES 12 and 13), the responses illustrated in FIGURE 17 indicate the preferences when the options are presented as a dichotomous presentation where one excludes the other. Generally the populations are evenly divided about their type of preferred participations.

Engineers and K-12 teachers closely follow the population as a whole. Physicians are more likely to work as team players; lawyers are less likely; professors are quite more likely to work individually.

The relative rankings of taking a course by interactive television (ranked a 4 overall as shown in FIGURE 10) and taking a course by computer (ranked a 3-4 in FIGURE 9) are compared in FIGURE 18. For all, except the professors, the sample favored interactive television over computer with approximately 70 percent of the sample in each subpopulation making that indication. Professors were just a little less likely to choose interactive television over the computer. The somewhat higher ranking of television over the computer in the earlier question is borne out in the response to the question illustrated in FIGURE 18.

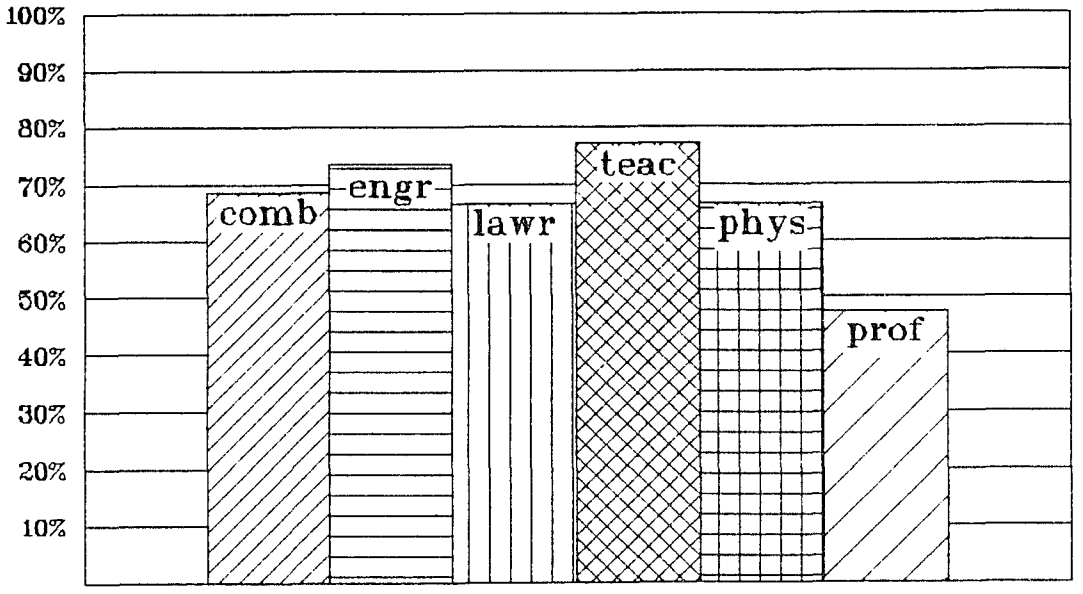

FIGURE 18. Preference for Interactive TV over Computer

Again, in FIGURE 19, the relative preference of interactive television over pencil and paper correspondence is shown. There is nearly a 90 percent preference in all of the categories. The lawyer sample was most inclined to use interactive television; teachers and professors indicated they were a little less likely to favor it than engineers and physicians.

FIGURE 20 reflects the relative preferences of the professional groups for a computer interactive course over a paper and pencil correspondence course. In the earlier investigation pencil and paper correspondence had relatively high 1 and 2 level responses with the highest ranking at 3 (FIGURE 7).

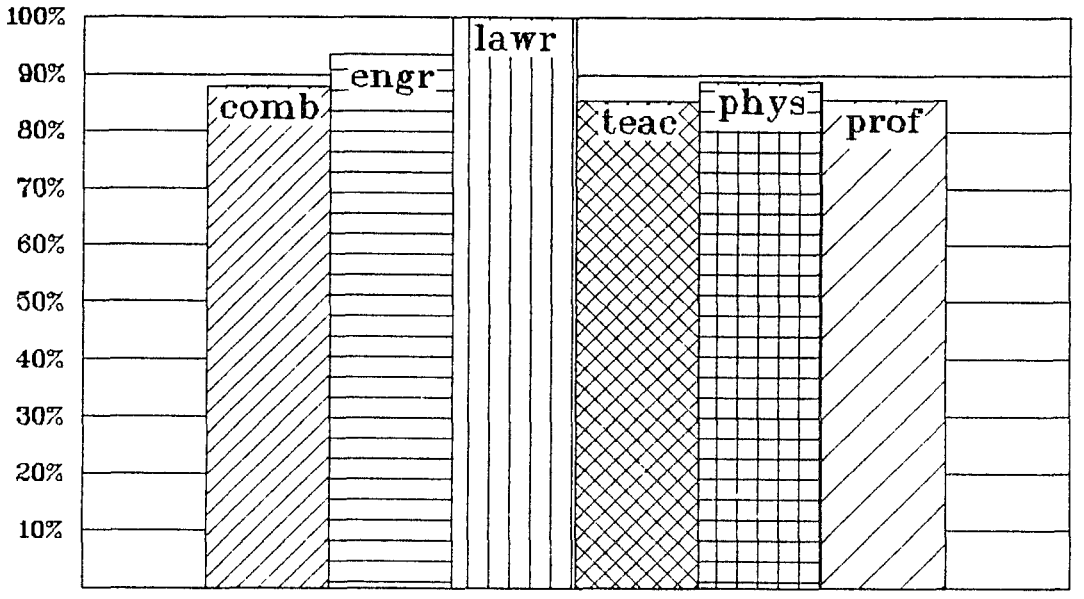

FIGURE 19. Preference for Interactive Television Over Correspondence

Course by computer had a high 1 ranking, but with peaks at 3 and 4 (FIGURE 9). In this comparison, it is the computer that gains the preferred positions with about a 70 percent rating. Physicians, professors and teachers are more likely to favor the computer; engineers and lawyers just a little less than 70 percent likely.

FIGURE 21 shows the area in which there is most divergence within the groups. The population as a whole has an 8 to 2 preference for a telecommunications course that is offered locally over a classroom course offered at a distance. There is wide difference between the desires of the subpopulations. The sample shows engineers are

almost evenly divided over the choice. The lawyer sample indicates they would all prefer the telecommunications course. Most of the teachers, nearly 9 of 10, would prefer to take a telecommunications course in order to avoid travel. Professors, in just over 7 cases out of 10, would take the telecommunications course. Physicians would take a telecommunications course in just over half of the instances.

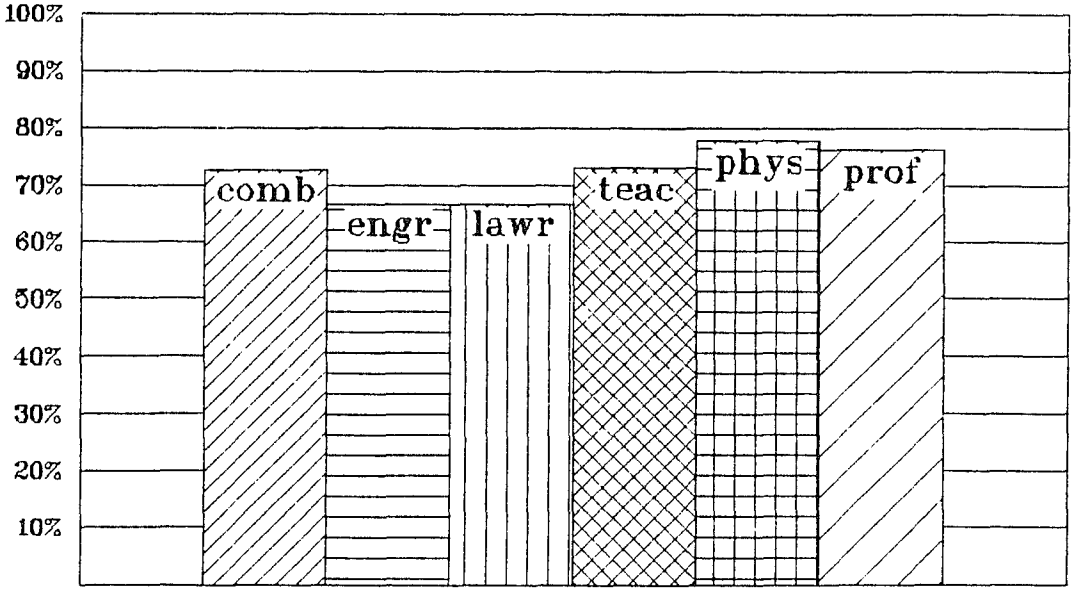

FIGURE 20. Preference for Computer Interactive over Correspondence

Much of the discussions with the sample respondents on this question revolved around the relative merits of the course offerings, the amount of participation and

social contact, the opportunity to have one's personal individual agenda met and the question, always, of the winter weather in the Marquette County area.

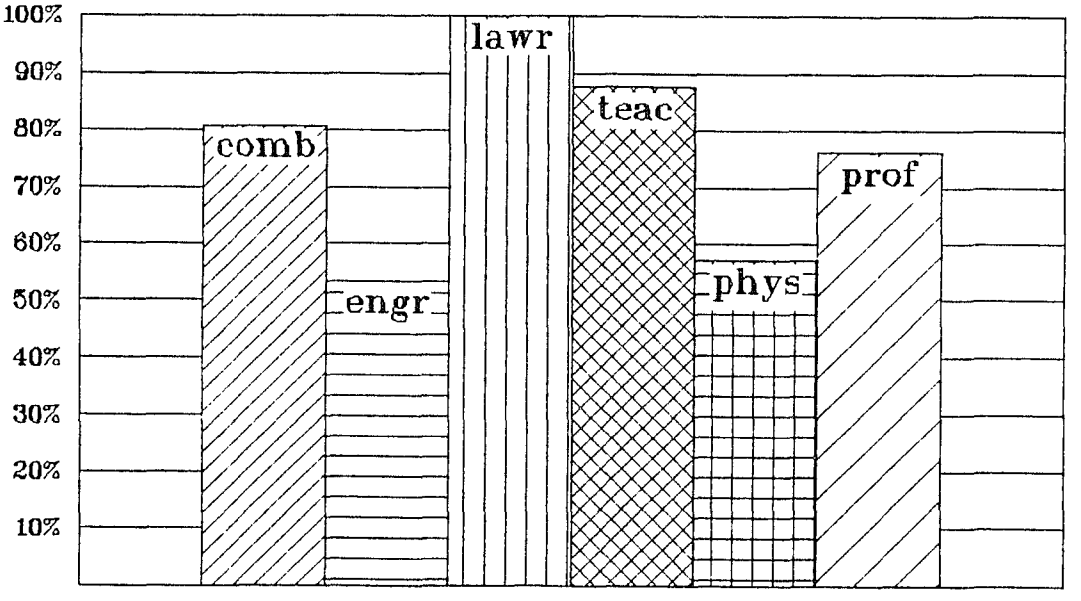

FIGURE 21. Preference for Local Telecommunications over Distant Classroom

Summary of Results

As the tables and figures used earlier in this chapter indicate, the population was not a normally distributed population. In addition, the small numbers in some of the subpopulations from which the samples were drawn and the correspondingly small sample numbers resulted in data figures which were more easily understood with tables and figures.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter a restatement of the objectives of the study is presented. Conclusions with respect to the objectives are stated, and areas for further research are suggested. A discussion of possible implications of the study as a portent for research or activity in the arena of distance education delivery of professional continuing education in the Marquette County, Michigan, area and in other similarly situated remote areas of the country is also explored. The chapter concludes with reflections on the study.

Summary

The researcher's purpose in this study was to investigate the behavior and attitudes of the members of five professional groups (engineers, lawyers, physicians, professors and K-12 teachers) in Marquette County, Michigan, toward professional continuing education via

distance education means by interviewing a randomly selected sample of the members of the five professional populations. In looking carefully at the various groups, their similar geographic locations and expectedly different behaviors and attitudes toward professional continuing education by distance means, one would expect to see more clearly which circumstances appeared to be most closely related to involvement in professional continuing education by distance means.

The study was limited geographically to the isolated, yet technology rich, Marquette County, Michigan, and was limited in scope to the populations studied and provided for the first time comparisons of the attitudes and behaviors of the five professions toward distance means of professional continuing education.

Based upon the five populations selected for the study and the known differences in their professional settings one might well anticipate findings of great difference. Members of the physician, lawyer and teacher populations must, under law, continue education for relicensing. Teachers may select Northern Michigan University in Marquette, within 30 miles of home for their studies. Doctors may select hospital provided training at Marquette General Hospital in Marquette or Bell Memorial Hospital in Ishpeming for some training. Lawyers have no local education center; the nearest school of law is four

hundred miles away. Doctors are about 400 miles from any medical school campus where post graduate courses are available.

Whether professionals in these five groups, and by extrapolation others, will use distance means of professional continuing education is both an educational and a financial question. These professionals have money to spend to gain the expertise they desire and are willing to buy information and training.

The results of the study provide a baseline measurement of attitudes and interests in distance education as a means of delivery for professional continuing education among professionals who would have the financial ability to support distance education delivery systems and technology.

As reported in Chapter IV, the study showed the five professional populations (engineers, lawyers, physicians, professors and K-12 teachers) in the Marquette County, Michigan, area have similar attitudes toward continuing professional education and continuing professional education using the media and methods of distance education. The populations examined and sampled are reported in detail there.

Over 70 percent of engineers and K-12 teachers are natives of Michigan's Upper Peninsula. Fewer than one third of the lawyers, physicians or professors are natives. Lawyers, physicians, and to a lesser extent professors tend to be of urban extraction.

Most of the professionals surveyed report some participation in professional continuing education. Over two thirds of engineers and lawyers were involved, nearly ninety percent of K-12 teachers, virtually one hundred percent of the physician sample and fifty seven percent of the professor sample had been involved in professional continuing education within the past year.

More than half of each sample, excepting the physician sample, had had experience with some form of distance education course presentation.

The attitudes toward a "Teacher in the Classroom" presentation was higher for every population than for any other type of presentation. An interactive television course, in which a high level of interest was demonstrated by all of the populations, ranked in second place. A course by videotape received a moderate positive response while courses by computer and paper and pencil correspondence had strong negative responses.

In comparing a distance education delivery means with classroom teacher delivery of instruction, the classroom teacher was preferred, though not to the extent as when the classroom teacher was compared with correspondence, videotape, or interactive computer.

Interactive television was preferred over computer interactive and/or paper and pencil correspondence. The interactive computer was preferred over pencil and paper correspondence, even by those who did not have ready access to computers.

The amount of interaction participants would desire in a class was nearly evenly divided between individual performance and team performance. Professors and lawyers evinced the strongest leanings toward working alone; physicians were more aligned with group participation.

Conclusions

The following conclusions are based on a review of the data and a recollection of the interviews with respondents. K-12 teachers and professors work toward attainment of paper credentials. Engineers, lawyers and Physicians tend toward amassing skills and abilities and the documentation for them.

Engineers respondents indicated an interest in specific study in a library, by video or by computer to assist them in current projects. Lawyers and physicians

in the sample also approached professional continuing education as a means to keep up skills, to learn what is current in their fields, and to find out what colleagues are doing that is successful. To a greater extent than others, physicians also use conference attendance as a respite from the regular work week.

K-12 teacher respondents indicated that for the most part, their participation in continuing education stopped when they attained the top of the salary schedule in their school district. Professors, most of whom had attained a Ph.D. for entry into the profession, responded that there did not now appear to be a need for professional continuing education as they had "mastered" their area of specialty.

In summary, while engineers, lawyers and physicians who responded to the researcher's questions indicated that they select specifically the skill or knowledge they need to study for a purpose, K-12 teachers and professors appear to think in terms of courses of long duration or attainment of a degree by taking courses from a required list when thinking of professional continuing education.

The apparent linkage between professional continuing education pursuits of engineers, lawyers and physicians is professional performance and marketability of skills. K-12 teachers and professors tend to find themselves lumped together with all others in their profession.

Society, and even the professionals themselves, appear unwilling or unable to distinguish levels of competence or skill among educators.

The approach to professional continuing education is profession linked, rather than locus linked. As an example, both engineers and K-12 teachers in the sample share similar Upper Peninsula and rural backgrounds though their approaches to continuing education differ markedly. Physicians and lawyers in the sample, whose continuing education behaviors are similar, came from urban areas; but so do a majority of professors. Again there is disparity between the continuing education practices of the lawyers and physicians, most of whom participate, and that of the professors, few of whom participate, even though their loci are similar.

The vast majority of respondents, regardless of profession, prefer courses presented by an instructor in a classroom. In the main, all respondents had classroom experiences and familiarity with this delivery method, while not all (only 44 per cent of physicians) had had distance education experiences.

Respondents who explained their preferences for the teacher in the classroom indicated a desire to have specific questions responded to, to get individual insights, and to get personal assistance or advice. Physicians particularly wanted small classes which would

allow them to model the instructor's behavior, to ask ethical and technical questions, and to "learn" the instructor as well as the skill.

Overall, there is the sense that physicians, lawyers and engineers work with and for the "public", and their their skills and abilities are evaluated many times each day. Every decision they make, measurement they take, patient they treat or client they advise develops an impression and shares it with others. K-12 teachers and professors, conversely, are evaluated daily only by students, who are held by schools and society generally, as being unable to accurately asses the quality of instructor. It appears to this researcher that each profession has adopted a paradigm, and that professionals in the sample responded in alignment to their respective paradigm.

The paradigm for the professions include these findings from the survey.

1. Engineers consider accuracy and reliability of computation vital assets. They continue to develop expertise and to maintain currency in specialized areas to help them market their skills.
2. Lawyers consider currency and presentation skill their strengths. They constantly research the latest court decisions in their special areas on need and

practice presentation. Lawyers are less likely than engineers or physicians to develop exclusive specialties.

3. Physicians consider reputation and competence paramount. They are aware of varying skill levels which embody competence. They are concerned that they behave in a fashion similar to colleagues and that their practices be of an "approved" nature.
4. K-14 teachers and professors; in contrast to engineers, lawyers and physicians; live anonymous lives. Unless they coach a popular sport, they are simply lumped into a "teacher" bunch. While there is comfort in the paradigm for those teachers and professors who are at the mid range of skill and competence, there is protection of the incompetent and frustration of the most capable. The breadth of the group in these two professions, in terms of continuing professional education participation, is greater than in the others. K-12 respondents, for example, who have completed only the entry degree or mandated hours beyond are nearly one third of the sample. Nearly another half of the sample had stopped participating when they reached the top of the salary scale.
5. Professors' evaluations are seldom made public, and in cases of at least one NMU department, student evaluations are not even reviewed by colleagues.

This isolation from scrutiny has developed an apparent paradigm of perpetual employment for professors.

Discussion of Implications

The study adds to the theoretical foundation of the field in extending the professional continuing education research specifically into the aspect of distance education application. The results can be used to structure professional continuing education offerings by both universities and schools and the private independent purveyor.

Now that an initial exploration of the responsiveness within the various populations has been assessed it would appear prudent to examine the populations of lawyers, physicians and engineers in particular, as populations providing opportunities for the use of distance education technologies because of their current attitudes and behaviors toward continuing professional education by distance means.

Based on the findings in this study, it would appear that K-12 teachers are more inclined to attend classroom programs, as are physicians, and that teachers tend to

stop participating in continuing professional education as they gain the top of the salary schedule in their school systems.

Professors are not as inclined toward participation in continuing professional education pursuits as the other professionals surveyed. In part this response to the study is based on the attitude articulated by professors that the professor is in "possession of a terminal degree" and has completed education.

Additional studies in similarly situated areas, or additional studies with specific populations in the Marquette County, Michigan, area could point out specific course offerings or specific types of instruction delivery that appeals to each professional group.

Suggestions for Further Study

The baseline attitude is so positively skewed that this researcher recommends a further study which would encompass the entire population of professionals in the Marquette County, Michigan, area in order to ensure that the data are accurate for the entire population, which numbers just under two thousand. Additional studies also need to be done in similarly situated remote areas of the United States, and with populations where professionals have fewer years of practice.

The longevity of many of the professionals, especially engineers and teachers, indicates that a similar study must be done in approximately five years as those now practicing retire and replacements enter the population. With the rapidly changing economy and world technological and political situations there must also be exploration of short-duration, lesson-specific instruction, in order to provide what the professionals need, when they need it.

The positive attitude toward the use of computers is a sign that there may be potential in computer interactive communication, though there is a reserve among the professionals in the fields interviewed about getting "on line" with others whom one has not met face-to-face.

The positive responses toward distance education technologies by the respondents in the engineer, lawyer, and physician samples indicates a need for study in each subpopulation. The study must assess specific need, preferred delivery method, and time and cost constraints.

Specific study, in consideration of the long length of employment manifested by members of the sample, must be done to assess ages of professionals. Study of the specific needs and desires of professionals, and of trends in technologies and in professional study must also be conducted.

Reflections

The goal of this section is to provide insights and hunches about the field of professional continuing education by distance means within the professions.

Academics (K-12 teachers and professors) have been caught in a race for paper certification of worth and salary scale climbing. There is little, if any, relationship between skill and ability and rewards apparent in these two professions. Where engineers. lawyers and physicians who develop specialized skill or merit can move to other geographical areas or can price their valuable skills at what the market will bear, educators are locked into s system that prevents individual advancement or recognition based on merit. Longevity, not competence, is the yardstick of evaluation for them.

Observation of society makes it plain that engineers, lawyers and physicians deal with the consumers of their services on as one-to-one basis. The client pays the professional directly in most cases. Teachers and professors are isolated (insulated) from the direct consumer linkage by boards of education and bureaucratic departmental structures.

Engineers, lawyers and physicians have the freedom to select continuing education which they desire. K-12 teachers are bound to completion of required courses

leading to a degree or within "a program" of study. Often K-12 teachers have little interest in the required courses.

In the case of engineers, lawyers and physicians, the more skilled become the leaders and exemplars. In education the skilled teacher of academics remains the journeyman, the non academic tends to become the administrator or leader.

The most recent literature in the field of education addresses a future of privatization of services, fragmentation of delivery systems, and an economic constraint which will require K-12 educators and professors to shift their paradigm to meet the new demands. As in other professions, the product will have to be packaged to meet the market demand. There will be more short, specific offerings for professional continuing education and fewer general courses of long (16 week) duration.

Do teachers like the classroom more than other professionals because they are acculturated to it? I think not. Teachers are locked into a socio-political system that they are unable (or unwilling) to change.

While degree achievement and credential attainment are the only avenue many K-12 teachers and professors see to "prove" competence in the system, others have marketplace recognition of their value.

It is the author's opinion that engineers and lawyers will find distance education instruction about specific topics more available in the future. Physicians, who value "hands-on" learning and collegiality, will continue to invest in campus based seminars for most professional continuing education, and K-12 teachers and professors will be slow to change their credential/pay scale based professional continuing education activities.

The major surprise for the investigator was in the area of continued professional education pursuit by educators, both K-12 teachers and professors. They appeared to value pursuit of learning least among the five professions in the study. Surely, additional research into the specific types of professional education pursuits practiced in these two groups is in order.

Personal insights have always been difficult for me to gather. In perparing and performing the tasks of this study, however, I have been able to see a number of growth areas and a number of tasks I perform well, and a number that have little interest for me. I am interested in and will continue research about short courses for educators, about changing the paradigm of education that teachers are

locked into, and of making the teaching profession more like the autonomous professions of physicians, lawyers and engineers.

One step in that direction will be the construction of courses for continuing professional eduction for my Marquette County colleagues. Courses that have a single, simple aim, that improve one skill or provide guided practice in a single facet of teaching.

APPENDICES

APPENDIX A

INTERVIEW SCHEDULE

DEMOGRAPHIC INFORMATION

"I'm Tony Grudnoski. I'm a doctoral candidate at Michigan State University. As part of my dissertation I am asking randomly selected (Doctors, teachers, lawyers, engineers) about their educational backgrounds and continuing education. All of the information will be held in strict confidence, and there will be no identification of individuals in the report of the complete study. Would you please take about ten minutes of your time now to respond to some questions."

(If yes, continue; if no, beg.)

2."First, I need some demographic information. Were you raised in the Upper Peninsula?" (Purpose: to elicit origin: Urban/Rural. Follow up if necessary.)

3."What is your age?" (family life cycle information)

4."Are you married?"
(if yes,)

5."What is the age and sex of each of your Children?" (Purpose: to elicit numbers, sex and ages of children, if any.)

- -

"Next I have some questions about your work in your profession."

6."What is your employment status?"

7."How long have you worked in your current position?"

8."How much longer do you plan/expect to work in your profession?"

9."Would you briefly describe your work?"

"Thank you for your cooperation in this. I have just a few questions now about professional education in your field.

10. "Where did you earn your entry level professional degree? What was the degree?

11."What degree do you currently hold in your profession?"

12."Do you have education beyond your degree?"

13."If you have engaged in any informal education or continuing professional education, what has been the major reason for your participation?"

14."Do you have a (fill in a-g) available to you at work or at home for the purposes of continuing professional education?"
a. telephone b. television c. vcr d. satellite dish
e. computer f. modem g.fax machine

15."I am going to list some types of educational presentation formats for you. I want you to tell me, if study in your professional field were to become available to you in the next year using these formats, what your interest level would be.

Please respond to these formats by telling me if your reaction to them would be NO INTEREST, SOME INTEREST OR VERY INTERESTED: NO INTEREST(meaning you would not consider it), SOME INTEREST(meaning you would consider it), VERY INTERESTED(meaning you would investigate or attend this type of presentation."

a." A course by live instructor:
b. A course by correspondence:
c. A course by television:
d. A course by videotape:
e. A course by computer:
f. A course at home:
g. A course at worksite:
h. A course on NMU/MTU campus:
i. A course on your alma mater's campus:
j. A course by instructor at group site:

16."In this last question you will be asked to make a choice between two alternative types of education. In pursuit of continuing education in your professional area would you be more likely to participate in education that was:

a.On campus or by live television
b.On Campus or by computer
c.On campus or by video cassette recording
d.for updating or about a speciality
"Thank you for participating in my study. I have appreciated the opportunity to speak with you."

Tally Sheet

(This section not for use except by researcher before collecting data. Removed after call connects and interview is conducted.)

Name __________________________ **Phone**

Address ________________________________ **ZIP**

Engineer **Lawyer** **Teacher** **Physician**

- -

DEMOGRAPHIC INFORMATION

1.Male **Female**

2. **Urban** **Rural** U.P.

3. **AGE**________

4.Single/Never been Married **Married** **Separated** **Divorced**

5.Children: Sex 1____2_____3____4____5____
Age 1____2_____3____4____5____

- -

6. **Company** **Government** **Self-employed**

Seeking employment **Retired** **Student**

6/a. Org. Size

7.How Long? This Job ____________________**8. to go**

9. Alone__ others sim stat ____ other types ____

specialist _____ supervisor _____ lead worker ____

- -

10. College ________________________

BS MS MD Ph.D. LLB Other

11.Current _______________

12. Yes No

13. Explanations

a. : :to maintain and improve competence
b. : :to understand oneself as a professional
c. : :to interact with colleagues
d. : :to enhance personal and professional position
e. Other

14.

	home	office
a. telephone	: :	: :
b. television	: :	: :
c. vcr	: :	: :
d. sat dish	: :	: :
e. computer	: :	: :
f. modem	: :	: :
g. fax	: :	: :

15.

	no int	some	very int
a.by live instructor			
b.correspondence			
c.television			
d.videotape			
e.computer			
f.home			
g.worksite			
h.NMU campus			
i.alma mater's campus			
j.inst. at group site			

16.

a. On campus	: : : :	by live television
b. On Campus	: : : :	by computer
c. On campus	: : : :	by video cassette recording
d. for updating	: : : :	about a speciality

APPENDIX B

July 31, 1991

(Pretest Group)

Part of the research for my doctoral studies program at Michigan State University includes a telephone interview with randomly selected members of your professional population in Marquette County. The study I am conducting requires pre-testing the instrument with an affinity group. I have selected you as a member of the group because I value your expertise and trust your comments and responses to help in the study.

Please, as a (name of profession), preview the interview schedule and respond or react to the additional questions in order to help me obtain the best information from those interviewed.

Guideline

The information I am seeking should show the level of interest and participation in Continuing Professional Education and the inclination toward the use of Distance Education as a study method. Only information that has a bearing on participation or attitude towards continuing professional education and distance education methods is of value.

Additional Questions

Should the reason for each of the questions be related to the person being interviewed before the question is asked?

Should there be additional and more specific questions on the various areas of study?

Is it necessary to give or send a pre-interview notice of selection into the sample to the prospective respondent? If so, what is the best method of giving the notice?

What is the best time of day to interview those who are (name of profession)?

Please feel free to call me at 906 228-8670 between 6 and 8 p.m. Monday through Friday should you want to discuss the instrument.

Responses to questions 4,5,6,14 and 15 are especially important to me. Include any other questions you'd suggest. I'd appreciate a response by Friday, August 9, 1991. Please return your reply in the enclosed Self Addressed Stamped Envelope.

Thanks for your help

Tony Grudnoski

(Sent to: Engineer, Carr Baldwin; Lawyer, Gerald Sherman; Physician, Dr. James Addison; K-12 Teacher, Blaine Betts; Professor, Dr. Raymond Ventre; all of whom are personal acquaintances.)

APPENDIX C

INTERVIEW SCHEDULE

"I'm Tony Grudnoski. I'm a doctoral candidate at Michigan State University. As part of my dissertation I am asking randomly selected _____ (engineers, lawyers, physicians, teachers) about their educational backgrounds and continuing education. Would you please take about six minutes of your time now to respond to some questions?"

Wait for Affirmation.

"Participation is voluntary; you may choose not to participate at all, may refuse to answer certain questions or may discontinue participation at any time. Any information you give me will be held in strict confidence, and there will be no identification of you as an individual in the report of the complete study.

"Should you have questions or concerns that are raised by your participation in this study feel free to call me, Tony Grudnoski, at 228-8670. If you desire a copy of the findings you may tell me that during this interview or call me at that number at anytime during the next month."

DEMOGRAPHIC INFORMATION

2."First, I need some demographic information. Were you raised in the Upper Peninsula?" (Purpose: to elicit origin: Urban/Rural. Follow up if necessary.)

3."In what year did you earn the degree that allowed you to begin practicing as a (engineer, lawyer, physician teacher)?"

- -

"Next I have some questions about your work in your profession."

4a "Are you currently employed?"

4b "Is your employer,

1. a governmental agency
2. a private company
3. or you self employed?

5."Have you always worked for (answer to 4b)?"

6."Do you plan to continue to work as (answer to 4b)?"

- -

7. "Where did you earn your entry level professional degree? What was the degree?

8.(For K-12 teachers and professors) "Have you obtained and other degrees or certification?"
9.(For engineers, physicians, lawyers) "Do you have a professional certification or speciality certification?"
10."If you have engaged in any formal education or continuing professional education, what has been the major reason for your participation?"

11. "I am now going to list some technologies such as video tape or television that you may have at work, at home, or in both places that would allow you to participate in distance education or continuing professional education. As I name them please tell me whether you have them at work, home, both or neither. Television; vcr; satellite dish; computer; modem; fax machine."

12. "I am going to list some types of educational course locations and presentations for you. I want you to tell me, if study in your professional field were to become available in the next year using these formats, what your interest level would be. We'll use a scale of zero to 10, zero for no interest to ten meaning you'll sign up today to attend the course.

a. A local campus course:
b. A course at worksite:
c. A course at home:
d. A course at a center within driving distance:
e. A course on a distant campus:
f. A course by pencil and paper correspondence:
g. A course by videotape/canned television:
h. A course by computer:
i. A course by interactive television where you can call in questions:
j. A course with a live instructor in a classroom
k. A course in a seminar setting with all students giving individual reports
l. A course with other students with whom you work in groups

13. Have you ever taken a course by other than traditional teacher and student in the same classroom means? Tell me about it.

14. "In this last question I'll ask you to make some preferences known by asking you to make choices between two categories. Please tell me which of the two you would prefer.
comparison one:

a. a course in a classroom with a teacher

b. a pencil and paper correspondence course

a. a course in a classroom with a teacher

c. a video course that you can review as you need

a: a course in a classroom with a teacher

d. a computer course with teacher and other student interaction

comparison two:
(a.) working individually or (b.) as part of a team or group

comparison three
(a.) a course by live television (called live interactive TV) where you can call in questions or (b.) a course by computer where you can also interact with others by keyboard

comparison four
(a.) a live interactive television course or (b.) a pencil and paper correspondence course

comparison five
a computer interactive course or a pencil and paper correspondence course

comparison six
a traditional classroom course at a distant site or a telecommunications course locally?

"Thank you for participating in my study. I have appreciated the opportunity to speak with you. Remember, if you desire a copy of the results you can ask now or call me at 228-8670 anytime during the next month."

APPENDIX D

TALLY SHEET

Name _____ Phone

Address _____ ZIP

Engineer Lawyer Teacher Professor Physician

- -

DEMOGRAPHIC INFORMATION

1. Male Female

2. Urban Rural U.P.

3. Began Practice_____

4. a. yes ___ no ___
   4. b. gov't _____, private co. _____, self-emp _____

5. yes_____ no _____

6. yes _____ no _____

- -

7. College _____

BS MS MD Ph.D. JD Other

- -

8. Yes No

Explanations

9. yes_____ no _____ exp

10. a. ___ to maintain and improve competence
    b. ___ to understand oneself as a professional
    c. ___ to interact with colleagues
    d. ___ to enhance personal and professional position
    e. other _____

11.	home	off	both	not
a. television				
b. vcr				
c. sat dish				
d. computer				
e. modem				
f. fax				

12.

	0 1 2	3 4 5 6	7 8 9 10
	no int	some	very int
a. A local campus course			
b. A course at worksite:			
c. A course at home:			
d. A course at a center within driving distance:			
e. A course/distant campus:			
f. A course/correspondence:			
g. A course by videotape: /canned television:			
h. A course by computer:			
i. A course by interactive television where you can call in questions:			
j. A course with a live instructor in a classroom:			
k. A course in a seminar setting with all students giving individual reports:			
l. A course with other students with whom you work in groups:			

13. yes _____ No _____ exp

14. a. a. b.
b. a. b.
c. a b.

Comparison

2.		3.		4.		5.		6.	
a.	b.	a.	b.	a.	b.	a.	b.	a.	b.

APPENDIX E

CODE

COLUMN 1
Profession
1=Engineer
2=Lawyer
3=Physician
4=K-12 Teacher
5=Professor

COLUMN 2
Subject Number

COLUMN 3
Sex
1=Male
2=Female

COLUMN 4
Locus
1=U.P.
2=Rural (other)
3=Urban

COLUMN 5
Start Year

COLUMN 6
Years Experience

COLUMN 7
Employment
0=Retired
2=Government
3=Private Company
4=Self Employed

COLUMN 8
College
1=NMU
2=MTU
3=MSU
4=UOM
5=WAYNE
6=COOLEY
7=OTHER MICH
8=INDIANA
9=ILLINOIS
10=OTHER

COLUMN 9
Entry Degree
1=BS/BA
2=MS/MA
3=MD
4=PhD
5=JD
6=Registration
7=Other

COLUMN 10
Further Education
0=No
1=Yes

COLUMN 11
Extent
1=Hours
2=Masters
3=MS plus
4=Registration
5=Other

COLUMN 12
Television
0=Neither/None
1=Home
2=Work/Office
3=Both

COLUMN 13
VCR
0=Neither/None
1=Home
2=Work/Office
3=Both

COLUMN 14
Satellite Dish
0=Neither/None
1=Home
2=Work/Office
3=Both

COLUMN 15
Computer
0=Neither/None
1=Home
2=Work/Office
3=Both

COLUMN 16
Modem
0=Neither/None
1=Home
2=Work/Office
3=Both

COLUMN 17
Fax
0=Neither/None
1=Home
2=Work/Office
3=Both

COLUMN 18
local campus
Rating 0-10

COLUMN 19
worksite course
Rating 0-10

COLUMN 20
home course
Rating 0-10

COLUMN 21
center/w/drive
Rating 0-10

COLUMN 22
distant campus
Rating 0-10

COLUMN 23
correspondence
Rating 0-10

COLUMN 24
canned TV
Rating 0-10

COLUMN 25
computer
Rating 0-10

COLUMN 26
interactive TV
Rating 0-10

COLUMN 27
classroom
Rating 0-10
COLUMN 28
seminar/indiv
Rating 0-10

COLUMN 29
seminar/groups
Rating 0-10

COLUMN 30
non-traditional ed
0=No
1=Yes

COLUMN 31
DE question 14a
1=classroom
2=correspondence
COLUMN 32
DE question 14b
1=classroom
2=video

COLUMN 33
DE question 14c
1=classroom
2=computer

COLUMN 34
DE question two
1=work individual
2=team or group

COLUMN 35
DE question three
1=Interactive TV
2=computer

COLUMN 36
DE question four
1=interactive tv
2=correspondence

COLUMN 37
DE question five
1=computer
2=correspondence

COLUMN 38
DE question six
1=distant class
2=interact tv

APPENDIX E

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

September 16, 1991

Anthony T. Grudnoski
216 West Hewitt Avenue
Marquette, MI 49855

RE: A DESCRIPTIVE STUDY OF ATTITUDES AND BEHAVIOR TOWARD PROFESSIONAL CONTINUING EDUCATION BY DISTANCE MEANS WITHIN FOUR PROFESSIONAL GROUPS IN MARQUETTE COUNTY, MICHIGAN, IRB #91-353

Dear Mr. Grudnoski:

The above project is exempt from full UCRIHS review. I have reviewed the proposed research protocol and find that the rights and welfare of human subjects appear to be protected. You have approval to conduct the research.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to September 15, 1992.

Any changes in procedures involving human subjects must be reviewed by the UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to our attention. If we can be of any future help, please do not hesitate to let us know.

Sincerely,

David E. Wright

David E. Wright, Ph.D.
Chair, UCRIHS

DEW/deo

cc: Dr. Peggy Riethmiller

MSU is an Affirmative Action/Equal Opportunity Institution

APPENDIX G

Demographic and Professional Characteristics of the Sample

At the outset of the study the population of the five professional groups was established as numbering 1718. The total included 253 engineers, 107 lawyers, 163 physicians, 832 K-12 teachers and 363 Northern Michigan University professors. Each group was counted from alphabetical lists prepared from recognized registers in the professions.

The engineer population was established as all engineers graduated from Michigan Technological University (regardless of specialty area) and living in the Marquette County area as recorded by the Michigan Technological University alumni office. The lawyer population was selected from the annual directory issue of the Michigan Bar Journal, April, 1992. This journal lists all members of the Michigan Bar. The geographical and alphabetical listings were cross-referenced to elicit lawyers whose main offices were in Marquette County. The physician population was acquired from the Marquette County Physician Registry. The registry operates as a referral service for all physicians practicing in the county and is located at the Marquette General Hospital, a regional medical facility.

The Population of teachers at the K-12 level came from the Marquette-Alger Intermediate School District 1991-92 Educational Directory listing of teachers in private and public schools in Marquette county. The Northern Michigan University telephone directory 1991-1992 was the source of the population of university professors. Only NMU staff classified as professor, assistant professor or instructor were enumerated in the population.

In TABLE 14 the number of professionals in the population is indicated in the first column (N), the proportion of the total population that this number represents is in column two (proportion).

TABLE 14. Population Characteristics--Respondents

Profession	N	proportion
Engineers	253	15%
Lawyers	107	6
K-12 Teach	832	48
Physicians	163	9
Professors	363	21
Totals	1718	99%*

*Fractional percentages result from rounding and therefore the total is less than 100 % and the population is 99.

With the sampling and replacement in accord with the plan at the outset, the number of respondents is constant at 99. Those from the original stratified random sample who

had moved from the area were considered attrition; those who refused to participate were replaced using the next randomly selected sequence number. The random numbers were over-sampled in order to yield the sample, the pilot study subsample and a replacement group because the researcher was aware the populations had aged nearly a year from inception of the study. The number of subjects who refused was 10 percent. This percent of non-response is not a statistical sample problem. "If more than 20 percent of the questionnaires are not returned, it is desirable to check a portion of the nonresponding group..."(Borg & Gall 1989 443). Of those who would not respond, the reason stated was the overall refusal to participate in any type of telephone survey.

The stratified sample of 99 subjects in the study include proportionate members of each group: 15 engineers, 6 lawyers, 9 physicians, 48 K-12 teachers and 21 Northern Michigan University professors. The 99 randomly selected subjects, within strata, were interviewed during a two week period in May, 1992.

Respondents were asked to provide information about their professional lives. TABLES 7 through 11 show the summary data for each listed demographic variable in this section.

In TABLE 11 the locus of origin of each of the professionals is examined. Overall, 71 percent of the professionals practicing in the Marquette County, Michigan, area are Upper Peninsula or rural area natives. Only 29% come from urban areas. Over half, 55.5 percent, are natives of the Upper Peninsula of Michigan.

TABLE 11. Sample Group Locus--by Profession

Profession	Upper Pen		Rural		Urban		Totals	
	N	%	N	%	N	%	N	%*
Engineers	12	80	2	13	1	6	15	99
Lawyers	1	17	1	17	4	67	6	101
Teachers	35	73	3	6	10	21	48	100
Physicians	3	33	1	11	5	56	9	100
Professors	4	19	8	38	9	43	21	100
Totals	55	56	15	15	29	29	99	100

*Rounding of percentages to the nearest whole number can increase or decrease totals to more or less than 100%.

The relationship of Males to Females is seen in TABLE 12. The professions of engineer and professor are most dominated by males, both lawyer and physician samples were about one third female, and the K-12 teacher sample was dominated by females who made up nearly 60 percent of the sample.

Frequency distributions of nominal data consist of two columns. The left-hand column indicates what characteristic is being presented and contains the categories of analysis. An adjacent column headed "frequency" indicates the number of cases in each category as well as the total number of cases (Levin 1977 16).

TABLE 12. Sample Representatives by Sex and Profession

Profession	Number in sample	Sex	
		Male	Female
Engineer	15	13 (87)	2 (13)
Lawyer	6	4 (67)	2 (33)
Physician	9	6 (67)	3 (33)
K-12 Teach	48	20 (42)	28 (58)
Professors	21	18 (86)	3 (14)
Totals	99	61 (62)	38 (38)

Numbers in parentheses are percentages.

Among the sample selected for interviews there was only one already retired person. In some of the groups there were others who stated that they were near retirement and therefore would not seek any continuing education. TABLE 13 shows how the respondents were employed. The majority (over 70 percent) were employed by government. The remainder were employed in an equally divided fashion either by a corporation or self-employed.

The single retired person was a professor. Those employed by the government are shown in column two. Those employed by a private corporation (pvc) and self employed (sel) are shown in columns three and four respectively, and totals along the rightmost and bottom column and row.

The professions vary considerably by the entry level degree that is usually obtained. For the most part there are special graduate degrees for lawyers and physicians and most college professors have attained a Ph.D. before commencing teaching. Engineers and K-12 teachers, on the other hand, tend to begin with a Bachelor's degree.

TABLE 13. Employment Type by Profession

Profession	ret	gov	pvc	sel	tot
Engineer		3	8	4	15
Lawyer		1	3	2	6
Physician		0	2	7	9
K-12 Teach		48			48
Professors	1	20			21
Totals	1	72	13	13	99

The crossbreak table (Isaac and Mitchell 1971) is the usual table type used for the display of values.

One can see from TABLE 14 that, although there are some professionals that began in their selected profession with less than the "proper" degree or credential, for the

most part the entry level degree is a special certification or course of study for that single profession.

TABLE 14 Entry Level Degree by Profession

Profession	B.S.	M.S.	M.D.	Ph.D.	J.D.	OTR
Engineer	14	1				
Lawyer					6	
Physician			8			1
K-12 Teach	45	3				
Professors	3	3		12		1
Totals	62	7	8	12	6	2

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lIST OF REFERENCES

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