Comparison of a Video Taped with a Live Version of a Survey Course in Special Education Regarding Gains in Knowledge as Well as Attitude Changes Toward Students with Disabilities

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LOYOLA UNIVERSITY OF CHICAGO

COMPARISON OF A VIDEO TAPED
WITH A LIVE VERSION OF A SURVEY COURSE IN SPECIAL EDUCATION
REGARDING GAINS IN KNOWLEDGE AS WELL AS ATTITUDE CHANGES
TOWARD STUDENTS WITH DISABILITIES

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF
CURRICULUM AND INSTRUCTION

BY
JANE WILKEN ANDRINGA

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CHAPTER I

INTRODUCTION

As higher education continues to become more costly, and as students become more diverse in age, live at geographic locations more distant, and need more part time higher education opportunities, it is incumbent on higher education institutions to service students not only at off campus locations but in their own homes by providing television versions of credit bearing courses (Blumberg, 1978; Dirr, 1985). Advances in technology have made television increasingly viable as a medium, especially as cable television and interactive capabilities have added to the technological repertoire (Arnall, 1984; Hackman & Walker, 1990). Any university that offers the most possible options for taking credit bearing courses is likely to serve more students, however diverse their needs (Clark & Cleveland, 1984; Keck, 1992; Millonig, 1988).

Advantages of Videotaped Versions of Courses

Many older undergraduate and graduate students find it difficult to enroll in live offerings of college courses due to their employment hours, other responsibilities, or their geographic locations. Such adult learners can benefit from the availability of video taped versions of college courses (telecourses). Further, their fields of study can benefit from having additional trained/accredited workers available as a result of being able to study at home or at local sites. Retraining needs of our current society also point to the need for updated training (Chute, 1984). Students living in rural areas, especially, can benefit from colleges providing the classroom to students locally through telecourses (often referred to in the current literature as distance learning) (Clark & Cleveland, 1984; Daniel, 1988; Dirr,
In addition to those students who need telecourses, there are others who prefer them. Most current students have grown up watching television and are especially comfortable with that medium (Hardison, 1977). New students or students who are not in a degree program also may prefer a telecourse over a live lecture-discussion format. Further, students returning after interrupted education may find the telecourse format less threatening (Hardison, 1977; Purdy, 1986; Scott, 1991). All students, including the less well prepared, may find them advantageous because of the ability to record, freeze, review, replay and watch at any time (Hardison, 1977; Daniel, 1988).

Telecourses can be at least as rigorous as the comparable live version. They may be carefully designed to motivate and pace the learner, and provide learning experiences not available in live versions. Usually included is a high quality textbook; a study guide; a taped lesson, in lecture format; sometimes taped field experiences not available to on-campus classes; and sometimes a discussion with students who were being taught in the taping session. Many telecourses also provide for live seminars. In interactive telecourses students often have access to a professor via telephone/computer conferencing. The teleconferencing component often is made available when the lesson is transmitted live. In summary, the telecourse version can pull from a variety of formats to present and make credit bearing courses accessible and effective (Daniel, 1988; Dirr, 1985; Gruebel, 1983; Smith, 1977).

Cost effectiveness has been cited as another advantage of developing telecourse versions of university level courses (Pultorak, 1992; Russell, 1992). The size of the university seems to be a major variable in whether it is indeed cost effective. Tremblay (1992) polled 71 top American research universities and found that public institutions of over 15,999 enrollment are most likely to benefit from cost effectiveness while public
institutions of under 8,000 enrollment public institutions are unlikely to benefit economically. Purchasing or renting telecourses would allow smaller institutions to provide distance learning without incurring production expenses (Daniel, 1988; Schramm, 1977) but control over the content of the courses is minimized. Cost sharing and consortia are another option for reducing costs (Gruebel, 1983; Welling, 1983). Universities must carefully assess their purposes; the planning necessary; the preparation and delivery components needed; and the cost factors involved when deciding whether or how to develop their own telecourse versions of courses (Daniel, 1988; Hudson & Boyd, 1984; Lacina & Book, 1991; Russell, 1992). Providing telecourses to students who need to be part time students or who need to learn at distant locations can increase college enrollments thereby providing a significant boon to universities concerned about low enrollment or wanting to expand (Gruebel, 1983; Hudson & Boyd, 1984). Students learn equally well from high tech and low tech systems (Russell 1992; Schramm, 1973, 1977).

Many researchers have found that telecourse versions of college level courses are equally as effective as live versions in teaching (Christopher, Shannon & Sims, 1980; Chu & Schramm, 1967; Denton, Clark, Rossing & O’Connor, 1984; Dirr, 1985; Egan, McCleary, Sebastian & Lacy, 1985; Ellis & Mathis, 1985; Gruebel, 1983; Hudson & Boyd, 1986; Kataoka, H. 1987; Keck, 1992; Kulik, Kulik & Cohen, 1980; Lacina & Book, 1991; Pultorak, 1992; Russell, 1992; Schramm, 1973, 1977; Scott, 1991; Smith, 1977; Smith, 1983; Stickell, 1963; Stone, 1988; Turner, 1989; Weingand, 1984). Attitude changes toward persons with disabilities also have been shown to be equal between telecourse and live versions of courses (Donaldson & Martinson, 1977; Pilkington, 1984; Wiesner, 1983). In the few instances when a telecourse version has been shown to be less effective than its live counterpart, the problem has been identified as an inferior version; e.g., poor quality of sound, reception or readability; less time spent in learning; less quality in teaching or fewer learning experiences provided (Beaudoin, 1986; Blumberg, 1978;

Research Needs

Despite the large body of research showing that telecourses are equally efficacious in providing knowledge, many professors still doubt that their particular course or discipline can be as taught as effectively in a televised version. A discipline that has not been specifically addressed by the research may be seen as a likely exception to the research outcomes (Schramm, 1977; Scott, 1991). Special education, for example, is one field where there is a dearth of research comparing effects. Although a small number of studies have dealt with attitude change toward the disabled as a result of taking live versus television versions of a course of study (Donaldson & Martinson, 1977; Pilkington, 1984; Walters, Russell, Wilmoth & Walters, 1986), only one study in special education was found that measured growth in knowledge. No significant difference was found in the amount of knowledge gained (Egan, McCleary, Sebastian & Lacy, 1988). In the attitude change studies, no significant differences were found in the amount of attitude change between the live and telecourse versions of courses (Donaldson & Martinson, 1977; Pilkington, 1984; Wiesner, 1983). This study was undertaken to validate the findings in the comparison literature and to expand the scope of inquiry in special education.

Governors State University in University Park, Illinois (a southern suburb of Chicago) has, for the last thirteen years, developed telecourse versions of selected undergraduate and graduate level courses to assist students who have difficulty attending live courses or who prefer taking a telecourse. The video tapes can be accessed by cable television, by
buying tapes, by leasing tapes, by borrowing from the library, or by viewing in the library. SPED 510, Survey of Exceptionalities, was taped in 1987. A large number, about 150 students, are enrolled in the course in each of the three annual trimesters. The course is designed to fulfill the mandate of Illinois House Bill 150 which requires that all new teachers, speech/language pathologists, school social workers, and school psychologists take such a course as well as teachers and support personnel who want to renew lapsed certificates. Each trimester, on average, three telecourse and three live versions of the course are offered with approximately 25 students in each class.

Two major purposes of the course are: 1) to ensure that all teachers and support personnel have knowledge of characteristics and methods for students with exceptionalities; and 2) that their attitudes toward such students are of a supportive nature. It is important for the faculty and students of Governors State University to know whether both versions of the course are fulfilling the two purposes equally well, and important for the field of special education to know whether televised special education courses can be used instead of live versions with equal success.

Significance of the Study

Because of the paucity of research studies comparing knowledge gain in special education and attitude change toward persons with disabilities as result of taking either a live version or a telecourse version of a special education course, special educators cannot now rely on research to guide them in decision making regarding whether to offer telecourse versions of their live courses. To address that need a research study was designed for the following purposes:

1) To determine whether there is a significant difference in the amount of knowledge gained as a result of taking the telecourse version of SPED 510 (Survey of Exceptionalities) as compared to taking the live class version.

2) To determine whether there is a significant difference in change of attitude
toward students with disabilities as a result of taking the telecourse version of SPED 510 as compared to taking the live class version.

Definition of Terms

**Telecourse** - video taped version of a course of study, often referred to in the literature as distance learning.

**Live class** - live lecture, discussion version of a course of study.

**SPED 510** - A 3 credit hour course of study (Survey of Exceptionalities) designed and delivered by Governors State University, open both to undergraduate and graduate students in education or school support service programs.

**Student with a Disability** - Any student who has been identified through referral, case study evaluation (CSE), and multidisciplinary conference (MDC) to be eligible for special education services and for whom there is an Individual Education Plan (IEP).

**Change in Attitude** - A change in attitude towards persons with disabilities as measured by a comparison of pre and post test scores.

**Gain in Knowledge** - An increase in knowledge about characteristics of and methods for students with disabilities as measured by pre and post test scores.

Limitations and Delimitations

1) Because the students select which version (video taped or live) they will take, the research is not of a pure experimental design since the students were not randomly assigned to classes. On the other hand this post hoc causal comparative design mirrors the reality of the current and future environment.

2) Since Governors State University is an upper level university (students begin in their junior year), the results may not be generalizable to students below the junior year.

3) The research results may be considered applicable to survey courses in special education exceptionalities. The results may not be extendable to courses in other
disciplines or even to other types of special education courses.

4) The data for this research was collected during the 1994 Winter trimester. It was not determined whether the demographic variables differed in Winter from the Spring/Spring and Fall trimesters.

5) Cost effectiveness was not addressed in this study.

6) Because the SPED 510 telecourse is not an interactive course, the literature search does not include studies comparing interactive telecourses with live versions with the exception of one study in special education

7) Studies involving less than one semester of instruction were excluded from the literature review of knowledge gain but were included in the literature review for change in attitude.

8) Student attitudes toward telecourse or live versions were not addressed.

Summary

The use of video taped versions of college level course work (telecourses) is common practice nationally. Adult learners select them both for reasons of need or preference. In the preponderance of comparison literature studies, telecourses are seen as equally effective as live courses in teaching. When making a decision on whether to develop, purchase, rent, revise, or continue a telecourse version, educators often turn to the research for guidance. Although there has been much research comparing telecourse and live versions of other types of courses, there are a dearth of studies in special education. The purpose of this research is to make the comparison both in knowledge acquisition and change of attitude toward students with disabilities between the telecourse and live versions of the survey course in special education, thereby contributing a missing piece to the college level comparison literature.
CHAPTER 2
REVIEW OF THE LITERATURE

In this chapter a review of relevant professional literature is presented in two major areas of concern: a) comparison of the efficacy of telecourse versus live class versions of courses in increasing knowledge; and b) comparison of the efficacy of telecourse versus live versions of courses in changing attitudes towards persons with disabilities. A summary of the literature review concludes the chapter.

Gain in Knowledge

Gain in knowledge was defined in Chapter 1 as an increase in knowledge as measured by comparison of pre and post test scores. Most of the research literature comparing knowledge gain between telecourse and live versions of courses employed non random, self selection placement of students in the two versions of courses. Although there is little difference in outcome, non-random placement of students research is discussed first, followed by random placement research. Finally, the only research report involving special education is discussed.

Studies Using Non random Selection Placement of Students

Blumberg (1978) compared knowledge gain in telecourse and live versions of an elementary statistics course at Washburn University of Topeka, Kansas. The sample was 306 students, 77 part time and 229 fulltime. A pre-test and post-test was administered to each student to determine amount of knowledge gained.

The outcome of this study was an exception to most research results in that there was a significant difference between the live and teleclass versions of the course with the live version clearly more successful. The difference is attributable to the following factors:
1) Tapes were not editable. Corrections and clarifications were presented to students in a handout at the orientation session.

2) Selection of which version to take was not strictly non random in that live version registrations were capped to ensure sufficient members in the telecourse version. As a result, some telecourse students may have had a negative attitude toward the telecourse version of this course.

3) Live version students had 11.5 hours more instruction than telecourse students.

4) Comparability of the two versions was further compromised by the absence of a live audience to ask questions as surrogates in the telecourse version. Telecourse students had to wait until three live Saturday workshops to ask questions or they could ask questions by telephone before the class was aired.

5) There were many fewer worked examples and solutions in the telecourse version.

6) More new material was presented in each telecourse class session than in each live version class session.

7) Statistics may require more live interaction than most other course content. If knowledge gained is to be at least equal in telecourse versions of courses, the course content and teaching must be comparable (Clark, 1983; Chu & Schramm, 1967; Russell, 1992; Schramm, 1977). Further, the telecourse version must be designed to make up for the absence of question and discussion opportunities (Blumberg, 1978; Daniel, 1988; Dirr, 1985; Gruebel, 1983).

Chu and Schramm (1967) tabulated 421 telecourse versus live classroom comparison studies over 60 propositions in six areas. Three hundred eight showed no significant difference. Sixty three showed a difference in favor of telecourses while 50 showed a difference in favor of classroom instruction. It was concluded that the evidence presented did not provide a basis for saying that students learn more from one version than the other. The data did appear to support Gagne's (1970) contentions that "...no single medium is
likely to have properties that make it best for all purposes" and that "Most instructional functions can be performed by most media" (pp. 363-364). Others who have argued that comparable performance can be expected regardless of the medium are (Clark, 1983, 1989; Hult, 1980; Russell, 1992; Salomon, 1981; and Schramm, 1973, 1977). Chu and Schramm (1967) believed that television had proven itself as a teaching medium if used correctly.

It is concluded from overwhelming evidence that television can be an efficient tool of learning and teaching. When it is not efficient, the reason is usually in the way it is used. Evidence favors the integration of television into other instruction, simplicity rather than "fanciness," emphasis on the basic requirements of good teaching, introduction of the medium so as to minimize resistance, and testing and revision of programs. Whether the television medium is to be preferred, and whether it is feasible for developing regions, depends on objectives and conditions. (Abstract)

In keeping with their contention that the medium doesn't matter, Chu and Schramm (1975) reported no difference in retention or learning among four treatments of feedback on learning involving 80 college students. Good teaching prevails regardless of the medium.

Hult (1980) assigned 96 graduate students, who were enrolled in a basic course in human development at the University of South Carolina, to three classes of 32 students each. Subjects were assigned on a matched group basis by age, knowledge of course content, attitudes toward TV and the course and previous course work. Condition one was TV without instructor contact, condition two was TV with four instructor led seminars, and condition three was live lecture and discussion. Pre and post testing on 50 questions revealed no significant difference in knowledge gained. Student attitudes toward TV instruction were significantly more favorable in condition two; i.e., TV with four instructor led seminars.
Kulik, Kulik and Cohen (1980) did a meta-analysis involving 54 studies that compared telecourse with live class instruction and involved only college level courses. Telecourse students did as well as or better than live course students. Other studies that showed no significant difference include Ellis and Mathis (1985); Greenhill (1958); Smith (1977); Thorman and Amb (1975); Whittington (1987); and Zalatino and Zalik (1977). If interactive television were not excluded from this study, much more no difference literature could be described. In one interactive telecourse study the researcher (Walker, 1992) concluded that neither face to face contact nor interpersonal rapport with other class participants were needed. Instead the amount of information transmitted was found to be the significant variable to achieving learning and satisfaction.

Schramm (1977) reported the results of numerous studies comparing telecourse and live versions of courses both nationally and internationally. One example was a set of 27 experimental comparisons made over three years involving Chicago TV College courses. Of 12 showing a significant difference, 10 were in favor of the telecourse. The remaining 15 showed no significant difference. The conclusion reached by Schramm after extensive national and international comparison was that:

The import of this rather impressive evidence is that distant teaching, well-conceived, well-supported with the proper media, really works. It works in developing countries or in highly industrialized ones, and at many different levels of education. Where data are available, they appear to show that students in one of these media-extended programs learn at least as well as students in the same curriculum in traditional classrooms. (p. 222)

Schramm's findings of no significant difference were extended as well to courses offered in other media such as audio alone when the courses were well conceived and students were motivated to learn.
Scott (1990) compared achievement between undergraduate evening and weekend college students taking telecourse versions with those taking live versions of seven foundations courses over four years at Troy State University in Montgomery, Alabama. Accomplishments of a subset (555 students) of the 6,300 student sample in following courses also were compared. The seven courses were: United States History I, Elements of Business, American National Government, General Psychology, General Sociology, Principles of Management, and United States History II. In two of the courses, United States History I and General Psychology, students received higher grades via the telecourse version but not to a significant degree. In American National Government, the grades were the same in both versions. In the other four courses, grades were higher in the live version, but not to a significant degree.

Six related follow up courses using a subset of 555 students, were evaluated for student grade point average consistency and improvement. Four of the follow up courses showed improvement of grade point average for telecourse students while two follow up average improvements favored the live class students. The differences were insufficient to indicate that concrete understanding and retention were negatively impacted to a degree that would warrant not offering both versions of courses in the future. The overall outcome was interpreted as showing consistency in student performance in both versions. Quality of instruction was found to be of paramount importance. Scott warns that, as the program is continued, course quality assurance must be maintained.

Smith (1983) compared the performance of 233 students in seven courses taken from Saddleback College in California. Equivalent telecourses and on-campus courses were taught by the same instructor. In the analysis of scores from pre and post tests no difference was found in the amount of knowledge gained.

Stickell (1963) reviewed 240 comparisons but excluded 217 as not being sufficiently rigorous in design, e.g., not random selected and no control group used. Only 10 met the
most rigorous requirements that fulfilled the random selection criterion and other criteria. Those will be reported in the next section on random design. From the remaining studies, Stickell (1963) cited Niven's review of all college level studies up to 1958 (Niven, 1958). The conclusion reached for these was equal knowledge gain. Twenty three of the 240 comparisons reviewed by Stickell (1963) were classified as partially interpretable. Twenty of those showed no statistically significant difference while three showed significantly in favor of the telecourses.

Wittington (1987) conducted a research review of evaluation that included Wayne State University's "Weekend College"; Waubonsee Community College in Sugar Grove, Illinois; the Ohio Post Secondary Telecommunications Program; the California Community College system; the Dallas County Community College in Texas; 200 two and four year colleges using Annenberg/CPB Project telecourses; Coastline Community college, Fountain Valley, California; Miami-Dade Community College offerings to 286 colleges and universities; and a report by the California Post secondary Education Commission. His conclusions were that:

1. Comparative studies indicate that students taking courses via television achieve, in most cases, as well as students taking courses via traditional methods.

2. Findings of equivalent student achievement hold even when rigorous methodological research standards are applied.

3. Television is a technological device for transmitting communication and has no intrinsic effect, for good or ill, on student achievement.

4. Effective instructional design and techniques are the crucial elements in student achievement whether instruction is delivered by television or by traditional means.

5. National producers and funders of telecourses employ rigorous standards and procedures to create academically acceptable products which will withstand the critical scrutiny of scholars. (pp. 54-55)
Studies Using Random Selection Placement of Students

Christopher (1980) randomly assigned 124 students, enrolled in an introductory college nutrition course for majors and non majors, into two equal sized groups; one to receive a multimedia presentation, the other to attend a traditional lecture discussion presentation of the same content by the same instructor. There were no significant background characteristics variables between the two groups that might have affected performance. Cognitive gains in the multimedia class were equal to or better than in the traditional class. It was concluded that "...lecture style courses...can be presented effectively through multimedia. Judicious use of this approach can free faculty time for other scholarly pursuits...".(p. 12)

Ellis and Mathis (1985), critical of comparison studies not using random assignment of students to the two presentation modes (televised versus conventional classroom lectures), randomly assigned 117 students enrolled in two introductory sociology courses to one of the two teaching modes. To ensure that content and presentation were matched, one class met in the conventional classroom for a live lecture while two other classes met simultaneously in adjacent rooms to receive the same instruction via television monitor. On the first test, students in the two video groups did less well than their counterparts. The problem was identified as poor sound amplification and an inability to read what had been written on the chalkboard. Those problems were corrected and adjusted for by the fourth and final test. Students in the video group performed as well as or better than students exposed to in person lectures. The results were interpreted to mean that students can learn as well from video lectures as from live lectures. Again, teaching and content being comparable, the results were the same.

Greenhill (1958), from Pennsylvania State University, reported comparisons made in seven courses over five semesters. In all the studies the same teachers taught comparable groups by the two methods that were taught at successive class periods with students
randomly assigned across the two sequences. Results of the studies consistently showed no significant difference in achievement. Television made it possible to extend the teaching of experienced professors to larger numbers of students than would have been possible under conditions limited to live instruction.

Stickell (1963) analyzed the methodology of 250 comparison studies up to 1963 and rejected the results of all studies not involving a full semester and those not using random selection and a control group. Only ten studies were accepted as "interpretable." The ten interpretable results were based on eight college courses and in all ten there was no statistically significant difference in knowledge gained between the televised and face to face instruction. The eight courses included psychology, chemistry, business law, sociology, meteorology, and music appreciation.

Zalatino (1979) undertook a study to determine whether class size and the degree of participation by students via response sheets would affect achievement and attitude toward televised instruction. Eighty one college students enrolled in a teacher education course were randomly assigned to one of four groups. Group 1 included 21 students receiving televised lessons as a group without response sheets; Group 2 included 19 students receiving televised lessons as a group with response sheets; Group 3 included 21 students receiving the same televised lessons individually in learning carrels without using response sheets; and Group 4 included 20 students who received the televised lessons individually without response sheets. At first testing for attitudes toward the teaching in each of the groups, there was a significantly more positive attitude on the part of the students in the group presentation classes over individual presentations and on the part of students using response sheets over those who did not. There was no significant difference in knowledge gained among the four treatments. The program lasted only four weeks and attitude differences became less as the course progressed. The authors concluded that a longer
time period may have caused the attitude differences to be much less. The content of the course was the same for all four groups but the teaching methods differed.

Comparative Study in Special Education

Egan, McCleary, Sebastian & Lacy (1988) carried out a research study on delivery of off-campus teacher preparation programs to remote, rural areas of Utah (defined as distances greater than 150 miles from the University campus). Twenty preservice/inservice teachers at two rural remote locations simultaneously received by video transmission a course entitled Educating Students with Behavior Disorders being taught on the University campus to 20 other subjects in the university instructional television studio. The same pre and post tests of knowledge were administered to both groups. Neither group outperformed the other on the objective pretest. Similarly, neither group outperformed the other on the post test.

A course evaluation rendered above average ratings of the course with higher ratings by the on campus group. Rural, remote students rated "provision of feedback relating to student progress" at a mean of 3.22 (with 5.0 being a rating of average) making it clear that feedback was an area that needed to be improved. Fifty-six percent of rural remote students also identified lack of discussion as a problem. Despite the dissatisfaction of rural remote students with feedback and lack of discussion opportunities, both groups learned equally well. Egan et al (1988) described the instruction as interactive, apparently because it was received simultaneously but the distance students had little opportunity to take part in discussion because only two microphones were available and students had difficulty both in securing them and in operating them. Receipt of support materials also was problematic. In summary, although learning was perceived by rural distance learners as negatively impacted by the poor feedback and lack of discussion opportunities, the one study found in the literature involving special education found no difference in knowledge gained, matching the outcome found in all the other subject areas described above.
Summary of the Gain in Knowledge Section

For both random placement and nonrandom placement of students in groups, including the special education study, the outcome is primarily the same (except for the flawed Blumberg (1978) research); i.e., that there is no significant difference between telecourse and live class versions of courses in knowledge gained. Although interactive telecourse research descriptions were omitted from this report because the Governors State University SPED 510 telecourse is not interactive, a review across interactive telecourse research revealed that the finding of no significant difference in knowledge gained pertains as well if the telecourse version is well designed (Hackman & Walker, 1990; Keck, 1992; Krohn, 1981; Pultorak, 1992; Ritchie & Newby, 1989; Russell, 1992; Silvernail & Johnson, 1990; Walker and Hackman, 1992). The equally effective outcomes reported above were further validated by a very inclusive report made available to those who request it from Russell (1993) which lists 144 knowledge gain studies including nonrandom and random assignment studies and both one way and interactive telecourses and their outcomes spanning the years 1952 to 1993. Russell continues to update the listing as new literature becomes available.

Change in Attitude

Change in attitude was defined in Chapter 1 as a change in attitude towards persons with disabilities as measured by a comparison of pre and post test scores. All of the studies described herein measured change in attitude, as defined in Chapter 1, by using Yuker's Attitude Toward Disabled Person's Scale, ATDP (Yuker, Block, & Campbell, 1960). Many teacher training programs provide coursework to prepare regular education teachers to educate children with disabilities in the mainstream. Usually, over one third of the curricular emphasis in special education coursework is designed to develop positive attitudes toward educating children with disabilities (Hoover, 1986).
Research in Changing Attitudes

Donaldson and Martinson (1977) randomly assigned 96 freshman or sophomore students in an introductory psychology course to four experimental groups. The purpose was in part, to assess the effectiveness in changing attitudes of a panel presentation about their disabilities by persons with visible physical disabilities. Additionally the purpose was to compare the differential effectiveness of live, video, and audio presentations of the panel discussion. The Attitude Toward Disabled Persons Scale (ATDP), Form O (Yuker, Block, & Campbell, 1960), was used as a dependent measure. The control group responded to the pre and post test without seeing or hearing the panel presentation. The live treatment group heard and saw the presentation but were not allowed to interact verbally with the panel members or their classmates. Video group participants viewed the panel presentation via TV monitor in an adjacent building without any interaction capability. Audio group participants listened to an audio tape of the presentation without any visual or interactive capability. Data also was analyzed to determine whether outcomes were affected by the sex of the subjects. No significant effects for sex were found.

Both the live and video taped presentations were significantly effective in modifying stereotypic attitudes towards the physically disabled. Nonsignificance of the audio presentation in changing attitudes was attributed to the lack of visual information. It was assumed that significant change in the live and video taped presentation was due to the panel members visually representing nonstereotypic images of persons with physical disabilities. The disabilities represented were cerebral palsy, blindness, quadriplegia, and paraplegia. Moderators raised questions about the persons with physical disabilities including their physical conditions, their perceptions of the attitudes of persons without disabilities towards them, their social lives, and their occupational goals in a 50 minute
discussion. Extensive analysis of the high validity and reliability data for the ATDP was included in the Donaldson and Martinson (1977) report.

Higgs (1973) assigned 300 subjects to ten different groups made up of 8th graders, 12th graders, college undergraduates, vocational rehabilitation counselors, college counsellors and parents with two groups from each type; one with high contact with persons with disabilities and one with low contact. Each subject completed an ATDP test. Although the study did not involve comparing live and video teaching it is worth noting because of the finding that high contact and more knowledge produced more positive attitudes. Older persons and females showed the most positive attitudes among the high contact subjects. The finding of sex differences by Higgs (1973) was not upheld in the Donaldson and Martinson (1977) research already described, or by Pilkington (1984).

Pilkington (1984) compared live versus video taped instruction on changing attitudes toward persons with disabilities, using the ATDP, equivalent Forms A for pre testing and B for post testing. Using subjects taking an undergraduate course, Exceptional Children, Pilkington compared not only the effect on attitude of the two versions of the course but also compared the attitude change scores of persons taking the course in 1974 and 1981 using a control group both in 1974 and in 1981. During the intervening years much international effort had been made to change attitudes towards persons with disabilities, to promote equal rights, and to integrate such persons into all aspects of society. The assumption was that, across society in general, attitudes toward persons with disabilities would have become more positive in the intervening years.

Random assignment to the telecourse and live versions was not possible in the provinces of Newfoundland and Labrador due to the geographic obstacles to University attendance for many students. Mean group scores, in the 1974 data collection, were compared from three groups: 1) live instruction on campus; 2) video instruction off campus; and 3) control group, on campus. The groups had 67 subjects, 63 subjects, and
35 subjects respectively. The control group was students taking a course in Educational Psychology and did not include any subjects who had taken a course in exceptional children. Although there were some individual higher scores both in the live and telecourse classes, they did not reach statistical significance. The control group did not show any change. The only independent variable that caused a significantly higher score on the ATDP was having a relative or a friend who was disabled. In 1981, equivalent Forms A and B of the ATDP test were administered to students in a psychology course as a control and students in a live version of the exceptional children course to determine whether attitudes toward persons with disabilities had changed over time. No video course was being offered at that time so only live instruction and the control group were compared. There was a significant difference was found in attitude on the pretest between the 1974 and the 1981 students with the latter demonstrating far more positive attitudes. This change was attributed to change in society's view of persons with disabilities. In both the 1974 and the 1981 subjects, there was no significant change between the pre and post tests given to the treatment groups in the special education course.

Walters, Trussell, Willmoth & Waters (1986) randomly assigned 44 secondary Health Occupations teachers with various educational backgrounds including medical technology, pharmacy, respiratory therapy, dental assisting and registered nursing, to three groups. All received a one-hour session with identical conceptual content dealing with problems and needs of persons with disabilities. Group 1 was self taught from a self-paced independent study module constructed from the verbal and visual content of the film. Group 2 heard a narrative transcription of the film in lecture format and engaged in discussion. The third group saw an unedited film, The Invisible Barrier, from the Disability Information Center. ATDP pretests were mailed to subjects and the ATDP post test was administered immediately following treatment. Overall effects of the different teaching strategies were not significant but variances were found depending on the training and experiences of the
students. The number of years of occupational experience, special coursework in teaching persons with disabilities, and highest degree earned rendered more positive attitude scores.

The ATOP Scales

The Attitude Toward Disabled Persons Scales (ATOP), Form O, with 20 items using a Likert scale (without a neutral alternative) was published in 1960 (Yukor, Block, & Campbell) followed by the addition of two equivalent alternate forms, Forms A and B, containing 30 items each in 1966. Monographs containing data first from 80 early studies, then from 35 more conducted later were reported in 1973. The ATOP still is used extensively. Three hundred twenty five studies had used the scales by 1986 (Yuker & Block, 1986). Hofstra University continues to receive inquires and examples of current use although these results have not been published. Dr. Yuker can be contacted by telephone at Hofstra University for post 1986 outcomes.

The ATOP scales may be used to compare data from different groups and to draw conclusions regarding the development of attitudes or interventions that can change attitudes. Relatively high scores indicate the respondents see persons with disabilities as similar to persons without disabilities. This view is labeled a positive view. Relatively low scores indicate the respondent perceives persons with disabilities as different or disadvantaged and is seen as a negative attitude. Because views toward persons with disabilities may be different in different times and locations it is recommended that the investigator develop norms for the particular groups being assessed (Yuker & Block, 1986).

The ATOP has been in continued usage because it is considered to be sufficiently reliable and valid as a research tool, is easily administered and easily scored. For over four types of reliability (test-retest, split-half, equivalence, and alpha), the overall median for the scale is approximately .80 and is similar for the three forms. When the two measures of attitudes are similar in length and format, the median construct validity correlation is
approximately .80. When the measures are different, the correlations range from .19 to .34. Correlation with other measures of prejudice and attitudes toward mainstreaming ranges from .43 to .47 (Yuker & Block, 1986).

Summary of the Change in Attitude Section

During the last 31 years many short lived measures of attitudes toward persons with disabilities have been developed. One long lived instrument that has good reliability and validity and also measures change in attitude continues to be applied in change of attitude research studies over time; i.e., the Attitude Toward Disabled Persons Scale (ATDP) published in 1966 by Yuker, Block, and Young. Four studies using the ATPD scale were described herein and represented mixed results, perhaps because they differed so greatly, one from the other. The Donaldson and Martinson study (1977) represented only one 50 minute panel presentation by persons with visually apparent physical disabilities in three formats; live, video, and audio. The ATDP pre and post tests were given on the same day and a significant change in attitude was claimed for the live and video presentation subjects. No attempt was made to follow up over time.

A study by Higgs (1973) using the ATDP included adults along with children but did not compare live and video teaching. It was included because of the finding that high contact and more knowledge produced more positive attitudes. Age and sex also were significant positive attitude variables. On the other hand, the sex variable was found not to be significant in the Donaldson and Martinson study (1977). Pilkington (1984) conducted a study comparing live versus video taped instruction in special education for a full semester using the ATPD but did not find significant change in any version. Both the video taped and live versions of the course had a positive but not significant change while the control group did not change at all. There was a significant difference in attitude towards persons with disabilities as measured by the pretest between students tested in 1974 and those tested in 1981. The change to a more positive attitude was attributed to
international efforts to change attitudes toward persons with disabilities. Having a relative or friend who was disabled was the only other independent variable that produced a significantly more positive score.

The final study described herein that used the ATDP to measure change in attitude was conducted by Walters et al (1986). It compared attitude change after one hour of comparable content via viewing a film, hearing a lecture or completing a self-taught module. There was not significant main effect from any of the treatments but three demographic variables accounted for more positive scores: 1) the number of years of occupational experience, 2) having had coursework in special education, and 3) having earned a higher degree. The fact that it is hard to show conclusions based on the studies discussed above matches the high variability in outcomes reported by Yuker and Block (1986) over 325 studies. Dr. Yuker continues to collect studies using the ATDP but has not yet published the results of post 1986 studies.

Summary of the Review of the Literature

Fifteen studies that either reported original research results or reviewed numerous research studies were described with only one study, Blumberg (1978), showing more knowledge gained by students in the live version of courses of study. That there is no difference in knowledge gained between live and telecourse versions of courses when the course is well designed and well taught was clearly demonstrated. The change in attitude review, however, was limited by a paucity of comparable studies and conflicting outcomes. No clear cut conclusion about comparable results emerged from the attitude review. The implication exists that ATDP survey outcomes have changed with the changing social view regarding persons with disabilities.
CHAPTER 3
RESEARCH METHODOLOGY

Introduction

Procedures used in collecting and analyzing the data for the research study are described in this chapter including background information on the design of the course of study, and the knowledge gain and attitude change instruments. Also described are the research questions, the subjects, the treatments, the methods of data collection, and the statistical methods applied. Results of the data collection are presented in Chapter 4.

Background Information

In 1987 a telecourse version of SPED 510, Survey of Exceptionalities, was developed to service adult students who, because of their geographic location, employment hours, other responsibilities, or personal preferences, needed to enroll in a telecourse version. Taking a course in Special Education is required in Illinois for all new teachers and support personnel or those wanting to renew lapsed certificates. In designing the telecourse version, great care was taken to match both versions in content by using the same syllabus (see Appendix 1), the same text (see Appendix 1), the same midterm examination (see Appendix 5), the same final examination (see Appendix 6), as well as requiring the same amount of field experience hours (15 hours) with reports on them (three reports) and a research paper. Twenty-four one-hour tapes (see Appendix 2) were filmed in studio using a live surrogate class to ask student questions and take part in discussions. The same two special education professors who had designed the original live version of the course designed the telecourse as well and each conducted half of the taped class sections.
The tapes were made available in five ways to meet the needs of students; i.e., via local cable television, by purchase availability, by lease availability, by borrowing from the library, or by viewing in the library. To provide additional field experiences, taping of field sites augmented by interviews with specific disability experts was included in the tapes. Those excerpts were viewed by the studio audience who were able to comment and pose questions. It was believed that their questions and comments would likely represent those a distance audience might have. A study guide was provided to telecourse students which included an introduction to the topic, suggested questions for students to research and vocabulary lists, a sample midterm examination, and pertinent handouts (Kasik & Andringa, 1988, 1991, 1994). The cadre of adjunct professors who teach the live versions of the course were provided with a listing of the tapes (see Appendix 2), their contents, how to access them, and a set of the same handouts provided in the telecourse study guide. All adjuncts were required to teach both versions of the course at least once to further ensure comparable knowledge of the content of both versions and all components. Telecourse version students meet six times a semester; for orientation, for three seminar sessions, for a midterm and for a final exam. Live class students meet weekly for a full semester (15 weeks) or twice a week (7 weeks) for half semester courses. Class sessions for all are three hours in length.

The two professors, who continue to revise and update the course, believed it was important to know whether both versions equally provide the training in knowledge and attitude regarding students with disabilities that current teachers and support personnel need in today's schools. If knowledge and attitude development were found to be equal across both versions, this might indicate that other telecourse versions of special education courses should be made available to learners who need or want them. If on the other hand, the versions were found to be unequal, design changes might be indicated for SPED 510.
Methods

As noted in Chapter One, there were two purposes for this study:

1. To determine whether there is a significant difference in the amount of knowledge gained as a result of taking the telecourse version of SPED 510 (Survey of Exceptionalities) as compared to the live class version.

2. To determine whether there is a significant change of attitude toward students with disabilities as a result of taking the telecourse version of SPED 510 as compared to taking the live class version.

Three criteria were used to investigate the hypotheses of this study; an attitude scale, a midterm knowledge examination and a final knowledge examination. The three criteria were assessed at the first class meeting as a pretest. In addition, the midterm was readministered half way through the class, and the final as well as the attitude measure were reassessed in the last week of the class.

Hypotheses

The above design led to the formulation of six research hypotheses. These were:

1. There will be a significant difference in the mean pretest scores of the examination of students enrolled in the regular class sections versus those enrolled in the telecourses sections.

2. There will be a significant difference in the mean pretest scores of the ATDP attitude scores of students enrolled in the regular class sections versus those enrolled in the telecourse sections.

3. There will be a significant difference in the mean pretest scores of the final examination scores of students enrolled in the regular classes versus the telecourses.

4. There will be a significant difference in the mean post test scores of the midterm examination of students enrolled in the regular class sections versus those enrolled in the telecourse sections.
5. There will be a significant difference in the mean post test scores of the ATDP scores of students enrolled in the regular classes versus those enrolled in the teleclasses.

6. There will be a significant difference in the mean post test scores of the final examination of students enrolled in the regular class sections versus those enrolled in the telecourse sections.

Statistical Methods

For each hypothesis, the means and standard deviations were reported. The null forms of the research hypotheses were tested by the t-test for independence with p.<0.05. Results were presented in text and tables.

Measurement of Dependent Variables

The Attitude Toward Disabled Persons Scales (ATDP)

The ATDP Scales, Form O (Yukor, Block, & Campbell, 1960) was selected to measure change in attitude because it is the only measurement of attitude change that has remained in continued usage from 1960 to 1994, is easily administered and scored, and has been shown to be both reliable (.80) and valid (.80) as a research tool (Yukor & Block, 1986). It can be administered either as an individual or a group test, uses a Likert type scale but without a neutral option, is either hand or computer scorable, and takes about 15 minutes to complete. Form O with 20 items was selected over subsequently developed Forms A and B with 30 items each because the reliability coefficients are the same for all three forms, ranging from +.75 to +.85 for Form O, from +.73 to +.89 for Form A and from +.72 to +.87 for Form B. There did not seem to be any reason, therefore, to use one or both of the longer forms.

All three of the equivalent Forms used some language that is dated; i.e., the term "disabled persons" has been changed by Federal legislation to read "persons with disabilities." The questions also referred to persons rather than children. Because the subjects in this study were teachers, the use of children seemed more appropriate.
Yukor and Block (1986) reported that both these modifications made no change in outcome. The original Form O and the modified one used in the study appear herein as Appendices 3 and 4. The revised Form O was administered at the first class session of each section and readministered at the final class session.

The actual mean score of subjects on the ADTP has been shown to differ in different areas, locations, and subject groups. Because of these differences it is recommended that the investigator refer to the pre and post norms of the subjects being tested rather than compare the means to other groups (Yukor & Block, 1986). The range of means reported from 1960 to 1986 for teachers and school support personnel ranged from 76.1 to 83.1 for Form O with no difference between males and females. The valid questions are whether a significant change occurred, whether the outcomes differed between the telecourse and live versions of the course, and whether they differed between sections of the course.

**The Pre Midterm and Post Midterm Content Knowledge Examinations**

Twenty multiple choice and eight true and false questions were developed to measure gain in knowledge up to the mid point of the course in both versions (see Appendix 5). It was administered at the first class session and readministered half way through the course as a post midterm by the instructor of each section.

**The Pre Final and Post Final Examinations**

Fourteen multiple choice and twelve true and false questions were developed to measure gain in knowledge from the mid term to the end of the course in both versions (see Appendix 6). It was administered at the first class session and readministered at the final class session.

**Pretest Scores**

Pretest scores for attitude and knowledge were used to measure the level of equivalency between live version and telecourse version students on entry to the course in addition to being used comparatively to measure change in attitude and knowledge.
Demographic Variables

The Demographic Survey

In the search of the literature no demographic independent variable that affected the no difference finding was found that had held up across the 1952-1993 period of time when comparison of telecourse and live versions of courses were being reported. Nevertheless, in the attitude change literature, claims were made for sex difference impact. Connie (1969), Siller and Chapman (1963) and Higgs (1975) reported a more positive attitude toward persons with disabilities for females, while Donaldson (1976) Lazar, Orpet and Denos (1976) and Pilkington (1984) reported no difference. Contact with persons with disabilities also rendered mixed results in the attitude change literature (Yukor & Block, 1986). Age of the subject had been thought to affect attitude change but again the literature showed inconsistent results (Yukor & Block, 1986). To test the effect on outcomes of demographic variables, and to compare the make up of live version and teleclass version students and characterize the subjects as a whole, a demographic survey was administered at the first class session (see Appendix 7).

Addition of Other Research Questions

Background

During the search of the literature on non interactive live versus telecourse comparisons as described in Chapter 2, it became apparent that the quality of curriculum and instruction was an important factor in producing learning both in live version sections and telecourse sections of courses (Clark, 1983; Chu & Schramm, 1967; Ellis & Mathis, 1985; Russell, 1992; Schramm, 1977; Scott, 1990; Walker & Hackman, 1992, Wittington, 1987). That effective instructional design and techniques are critical was found in the interactive literature as well (Hackman & Walker, 1990; Keck, 1992; Krohn, 1981; Pulturok, 1992; Ritchie & Newby, 1989; Russell, 1992; Silvernail & Johnson, 1990; Walker & Hackman, 1992). Because of this strong finding, that the quality of teaching
and content can create significant differences in learning, statistical analysis by class section was carried out as well. Although every effort to provide high quality content and activities was made in the design of SPED 510 in both formats and all adjunct instructors were trained to use all available content, individual instructors can differ both in what they choose to emphasize and how they instruct.

Comparison of Knowledge and Attitude Scores by Class Section

In order to establish entry level equivalency, the pretest scores both in knowledge and attitude were compared by class section. Change results between pre and post testing also were measured by class section. These activities were carried out to answer two additional research questions: 1) Will there be a significant difference by class section in the amount of knowledge gained? and 2) Will there be a significant difference by class section in the amount of attitude change?

Statistical Methods

For each question, ANOVA was used to investigate the null form. Results were presented in text and tables.

Summary of Research Methodology

In Chapter 3 the design of the telecourse and the live version of SPED 510, Survey of Exceptionalities, was described showing how the two versions were made as identical as possible in content. Methods used to measure attitude change, change in knowledge, and demographic variables were described and appendixes showing the testing instruments were identified. Six hypotheses and the statistical methods applied were described. Two research questions regarding comparisons by class section were added and methods for testing described. The data obtained is presented in Chapter 4.
CHAPTER 4  
DESCRIPTION OF THE DATA  

Findings  

Detailed in the prior chapter were the hypotheses and additional questions to be tested and the methods used for testing the null form of each. The outcome of those procedures are presented in this chapter in text and tables.  

Description of the Sample  

A total of 132 students enrolled in and 122 completed SPED 510 in the Winter trimester of 1994. There were five sections: three live classes with 21, 28, and 29 students who completed the course, with a total N of 78 for the live class version and two telecourse classes with 21 and 23 students who completed the course, with a total N of 44 for the telecourse version. The total N of all students who completed the course was 122. The numbers of students who did not complete the course (10 students) were evenly distributed across the five sections. The sample was made up of 82 percent females. The median age of all students was 30.14 years with 37.5 percent of the sample in the 21 to 25 year age range and 13.5 percent of the sample in the 26 to 30 year age range. The majority, 84.5 percent, lived in the suburbs with an even split of the others living in rural and in urban areas. Fifty percent of the sample were undergraduate students with 70.5 percent of the sample currently enrolled in a degree program at GSU.  

Students enrolled in SPED 510 for the following reasons: 44.7 percent as a requirement for the B.S. in ELED, 28.2 percent as a required class for other degree, 19.4 for a variety of reasons, 3.9 percent for required courses for the M.S. in Elementary Education, and 3.9 percent to update a lapsed certification. The reasons for opting for the
telecourse or live course were varied. Primary reasons for enrollment in the regular class were: 31.9 percent personal preference, 16.7 percent schedule; and 16.7 percent class discussion and interaction. Major reasons for opting for the telecourse were: 58.2 percent scheduling, 25.6 percent convenience and flexible time. Twenty-five students were preparing to teach at the high school level and 18 at the middle school junior high level, making at least 35 percent who were preparing to teach or work in a particular subject area. At most 11.5 percent were preparing to work in special education. Forty-six percent planned to work at the elementary level. The educational level they were preparing to serve is described in Table 1.

Table 1.--Level Subjects Preparing to Serve

<table>
<thead>
<tr>
<th>Level</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>9</td>
<td>7.4</td>
</tr>
<tr>
<td>Primary</td>
<td>44</td>
<td>36.1</td>
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<tr>
<td>Intermediate</td>
<td>12</td>
<td>9.8</td>
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<tr>
<td>Middle/Jr. High</td>
<td>18</td>
<td>14.8</td>
</tr>
<tr>
<td>High School</td>
<td>25</td>
<td>20.5</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>11.5</td>
</tr>
<tr>
<td><strong>Total N</strong></td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

ATDP Scores

The distribution of initial ADTP scores, as measured by the pretest, is presented in Table 2. The scores ranged from 51 to 74 with the mean being 62.91 and the standard deviation being 4.86. The comparable figures at post test, given at the end of the course, were a mean of 62.59 and a standard deviation of 5.27. Per Table 3, the range was from 48 to
Thus, in the main, per means, there was little shift in ATDP scores over the 15 week course.

Table 2.--Descriptive Summary of Pretest ATDP Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>53</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>54</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>55</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>56</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>57</td>
<td>5</td>
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</tr>
<tr>
<td>58</td>
<td>7</td>
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<tr>
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<td>0.8</td>
</tr>
<tr>
<td>73</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>74</td>
<td>2</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Total N 122

Mean = 62.59  SD = 5.27
Table 3.--Descriptive Summary of Post Test ATDP Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>49</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>50</td>
<td>1</td>
<td>0.8</td>
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<tr>
<td>51</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>53</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>54</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>55</td>
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<td>0.8</td>
</tr>
<tr>
<td>56</td>
<td>3</td>
<td>2.5</td>
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<tr>
<td>57</td>
<td>3</td>
<td>2.5</td>
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<tr>
<td>58</td>
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<td>4.9</td>
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<td>59</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td>60</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td>61</td>
<td>12</td>
<td>9.8</td>
</tr>
<tr>
<td>62</td>
<td>12</td>
<td>9.8</td>
</tr>
<tr>
<td>63</td>
<td>11</td>
<td>9.0</td>
</tr>
<tr>
<td>64</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>65</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>66</td>
<td>5</td>
<td>4.1</td>
</tr>
<tr>
<td>67</td>
<td>10</td>
<td>8.2</td>
</tr>
<tr>
<td>68</td>
<td>5</td>
<td>4.1</td>
</tr>
<tr>
<td>69</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>70</td>
<td>6</td>
<td>4.9</td>
</tr>
<tr>
<td>71</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>72</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>73</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>74</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Total N 122

Mean = 62.59
SD = 5.27
Midterm Examination Scores

Regarding the pretest of the mid term, refer to Table 4 for the distribution of scores. The mean was 63.91 and the standard deviation was 7.94 with the extreme scores being 42.86 to 82.14. The comparable statistics at the post test of the mid term were a mean of 79.74 and a standard deviation of 9.72. The extreme scores were from 50.00 to 100.00. Refer to Table 5 for the distribution of post test mid-term scores.

Table 4.--Descriptive Summary of Pretest Midterm Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 to 45</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>46 to 50</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td>51 to 55</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>56 to 60</td>
<td>17</td>
<td>13.9</td>
</tr>
<tr>
<td>61 to 65</td>
<td>39</td>
<td>32.0</td>
</tr>
<tr>
<td>66 to 70</td>
<td>23</td>
<td>18.9</td>
</tr>
<tr>
<td>71 to 75</td>
<td>22</td>
<td>18.0</td>
</tr>
<tr>
<td>75 to 80</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>81 to 85</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

Mean = 63.91  SD = 7.94
Table 5.--Descriptive Summary of Post Test Midterm Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>51 to 55</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>56 to 60</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>61 to 65</td>
<td>10</td>
<td>8.2</td>
</tr>
<tr>
<td>66 to 70</td>
<td>12</td>
<td>9.8</td>
</tr>
<tr>
<td>71 to 75</td>
<td>21</td>
<td>17.2</td>
</tr>
<tr>
<td>76 to 80</td>
<td>13</td>
<td>10.7</td>
</tr>
<tr>
<td>81 to 85</td>
<td>17</td>
<td>13.9</td>
</tr>
<tr>
<td>86 to 90</td>
<td>36</td>
<td>29.5</td>
</tr>
<tr>
<td>91 to 95</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td>96 to 100</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

Mean = 79.74 SD = 9.72

Final Examination Scores

The pretest of the final test scores are noted in Table 6. The scores ranged from 32.50 to 92.50 with the mean of 64.32 and standard deviation of 11.71. At the post test of the final, the mean was 80.16 with a standard deviation of 8.92. The range of the scores was from 57.50 to 97.50 and the distribution is given in Table 7.
### Table 6.--Descriptive Summary of Pretest of Final Examination Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 to 35</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>36 to 40</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>41 to 45</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>46 to 50</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>51 to 55</td>
<td>18</td>
<td>14.8</td>
</tr>
<tr>
<td>56 to 60</td>
<td>20</td>
<td>16.4</td>
</tr>
<tr>
<td>61 to 65</td>
<td>17</td>
<td>13.9</td>
</tr>
<tr>
<td>66 to 70</td>
<td>15</td>
<td>12.3</td>
</tr>
<tr>
<td>71 to 75</td>
<td>10</td>
<td>8.2</td>
</tr>
<tr>
<td>76 to 80</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>81 to 85</td>
<td>5</td>
<td>4.1</td>
</tr>
<tr>
<td>86 to 90</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>91 to 95</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

Mean = 64.32  
SD = 11.71

### Table 7.--Descriptive Summary of Post Test Final Examination Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>56 to 60</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>61 to 65</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>66 to 70</td>
<td>19</td>
<td>15.6</td>
</tr>
<tr>
<td>71 to 75</td>
<td>13</td>
<td>10.7</td>
</tr>
<tr>
<td>76 to 80</td>
<td>23</td>
<td>18.9</td>
</tr>
<tr>
<td>81 to 85</td>
<td>27</td>
<td>22.1</td>
</tr>
<tr>
<td>86 to 90</td>
<td>24</td>
<td>19.7</td>
</tr>
<tr>
<td>91 to 95</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td>96 to 100</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

Mean = 80.16  
SD = 8.92
Research Hypotheses Testing Data

**Research Hypothesis 1**

The first research hypothesis was that there would be a significant difference in the mean pretest of the midterm examination knowledge scores of students enrolled in the regular classes and those enrolled in the telecourses. The mean and standard deviation by group were: live version (\(M = 63.51, SD = 7.59\)) versus the telecourse version (\(M = 64.61, SD = 8.57\)). The null form of the research hypothesis was investigated by the t-test with \(t(120) = 0.74\) (\(p = 0.46\)). There was a failure to reject the null hypothesis. The two groups had no significant difference in their entry level academic knowledge base of materials tested on the midterm.

**Research Hypothesis 2**

The second research hypothesis was that there would be a significant difference in the mean pretest ATDP scores of students enrolled in the regular class as versus those enrolled in the teleclasses. The means and standard deviation by instructional mode were: live version (\(M = 62.53, SD = 4.29\)) and telecourse version (\(M = 63.59, SD = 5.70\)). When the null hypothesis was tested, the resulting \(t(120)\) was 1.17 (\(p = 0.25\)). There was a failure to reject the null hypothesis; i.e., the attitudes of the two groups did not vary significantly.

**Research Hypothesis 3**

The third research hypothesis was that there would be a significant difference in the mean pretest of the final examination scores of students enrolled in the regular classes versus those enrolled in the telecourse sections. The descriptive statistics by mode of instruction were: live version (\(M = 63.46, SD = 11.50\)) and telecourse version (\(M = 65.85, SD = 12.06\)). The t-test was used to investigate the null form of this hypothesis. The resulting \(t(120)\) was 1.08 (\(p = 0.28\)). There was a failure to reject the null hypothesis. No initial group differences were evident.
Research Hypothesis 4

The fourth research hypothesis was that there would be a significant difference in the mean post test of the midterm examination of students enrolled in the regular class sections versus those enrolled in the telecourse sections. The means and standard deviation by instructional mode were: live version (M = 19.62, SD = 79.95) and telecourse version (M = 79.95, SD = 10.17). The means were statistically similar. That no significant difference existed was confirmed when the null hypothesis was tested (t(120) = 0.64, p = 0.53). There was a failure to reject the null hypothesis.

Research Hypothesis 5

The fifth research hypothesis was that there would be a significant difference in the mean post ATDP scores of students enrolled in the regular class sections and those enrolled in the telecourse sections. A statistical summary by group was: live version (M = 62.83, SD = 5.02) and telecourse version (M = 63.00, SD = 5.76). The t-test confirmed that the difference between the means was not significant, so there was a failure to reject the null hypothesis (t(120) = 0.17, p = 0.87).

Research Hypothesis 6

The sixth research hypothesis was that there would be a significant difference in the mean post test of the final examination scores of students enrolled in the regular class sections and those enrolled in the telecourse sections. The means and standard deviation by group were: live version (M = 79.78, SD = 9.56) and telecourse version (M = 80.85, SD = 7.81). The null form of the research hypothesis was tested by the t-test (t(120) = 1.50, (p = 0.15). There was a failure to reject the null hypothesis. Thus, no significant difference was found in the final scores by instructional modality.

Summary of Hypothesis Testing

In total, six research hypotheses were investigated that compared telecourse with live version courses in knowledge gain and attitude change. There was a failure to reject
all hypotheses. Further, no significant attitude change occurred as a result of taking the course. Telecourse and live course students were equivalent both in knowledge level and attitude scores on entry to the course as measured by the pretests. Regarding the knowledge domain, there were no significant differences between the telecourse versus live class students in knowledge gained. Regarding the attitude domain, there were no significant differences between the telecourse and live class students in change of attitude.

Additional Research Questions Data

Additional Research Question 1

The first additional research question was whether there would be a significant difference in knowledge gained by class section. To establish equivalence on entry by section, the pretest scores of the midterm examination and the pretest scores of the final examination are compared by class section in Tables 8 and 10 respectively and ANOVA testing for significance results are presented in Tables 9 and 11.
Table 8.--Descriptive Summary of pretest Mid-Term Knowledge Scores by Class Section

<table>
<thead>
<tr>
<th>Type by Class</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1</td>
<td>21</td>
<td>66.32</td>
<td>6.83</td>
</tr>
<tr>
<td>Class 2</td>
<td>28</td>
<td>64.29</td>
<td>8.30</td>
</tr>
<tr>
<td>Class 3</td>
<td>29</td>
<td>60.71</td>
<td>6.61</td>
</tr>
<tr>
<td>R Total N</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecourse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 4</td>
<td>21</td>
<td>66.16</td>
<td>7.79</td>
</tr>
<tr>
<td>Class 5</td>
<td>23</td>
<td>63.20</td>
<td>9.16</td>
</tr>
<tr>
<td>T Total N</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9.--ANOVA Summary Table of Pretest Midterm Knowledge Scores by Class Section

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among</td>
<td>4</td>
<td>540.36</td>
<td>135.09</td>
<td>2.23</td>
</tr>
<tr>
<td>Within</td>
<td>117</td>
<td>7082.28</td>
<td>60.53</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>7622.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the five classes, the means ranged from 60.71 to 66.32. In ANOVA testing, the F(4, 117) of 2.24 revealed no significant difference by section regarding the midterm scores on the pretest.

Equivalency on entry was established for the knowledge to be tested by the final examination in the same way. The descriptive summary by class section is presented in Table 10 and the ANOVA testing results in Table 13.
Table 10.--Descriptive Summary of Pretest Final Knowledge Scores

<table>
<thead>
<tr>
<th>Type by Class</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1</td>
<td>21</td>
<td>65.95</td>
<td>8.96</td>
</tr>
<tr>
<td>Class 2</td>
<td>28</td>
<td>61.96</td>
<td>13.25</td>
</tr>
<tr>
<td>Class 3</td>
<td>29</td>
<td>63.10</td>
<td>11.39</td>
</tr>
<tr>
<td>R Total N</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecourse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 4</td>
<td>21</td>
<td>67.38</td>
<td>14.09</td>
</tr>
<tr>
<td>Class 5</td>
<td>23</td>
<td>64.46</td>
<td>9.97</td>
</tr>
<tr>
<td>T Total N</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11.--ANOVA Summary Table for Pretest Final Examination Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among</td>
<td>4</td>
<td>541.45</td>
<td>112.86</td>
<td>0.82</td>
</tr>
<tr>
<td>Within</td>
<td>117</td>
<td>16136.52</td>
<td>137.92</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>16587.96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was a narrow range of means by class from 61.96 to 67.38. The resulting F(4, 117) of 0.82 from ANOVA testing established no significant variance in final examination knowledge scores on pretesting. Entry level equivalence in knowledge was clearly established.

Comparison of change in knowledge by class section data were collected by post testing with the midterm and final examinations. The descriptive summary of post test midterm scores is presented in Table 12.
Table 12.--Descriptive Summary of Post Test Midterm Scores by Class Section

<table>
<thead>
<tr>
<th>Type by Class</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1</td>
<td>21</td>
<td>69.05</td>
<td>6.32</td>
</tr>
<tr>
<td>Class 2</td>
<td>28</td>
<td>83.29</td>
<td>8.91</td>
</tr>
<tr>
<td>Class 3</td>
<td>21</td>
<td>83.74</td>
<td>5.45</td>
</tr>
<tr>
<td>R Total N</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecourse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 4</td>
<td>21</td>
<td>84.18</td>
<td>9.00</td>
</tr>
<tr>
<td>Class 5</td>
<td>23</td>
<td>76.09</td>
<td>9.77</td>
</tr>
<tr>
<td>T Total N</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The range of means was from 69.05 to 84.18 with regular class one being the lowest and teleclass four being the highest. The two other regular classes were most similar to teleclass four.

ANOVA was applied to test for significance and the results are presented in Table 13.
Table 13.--ANOVA Summary Table of Post test Midterm Scores by Class Section

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among</td>
<td>4</td>
<td>3940.39</td>
<td>985.10</td>
<td>15.36</td>
</tr>
<tr>
<td>Within</td>
<td>117</td>
<td>7499.47</td>
<td>64.10</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>11439.86</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Significant differences by class section was established $F(4, 117) = 15.37$, $p < 0.00$. To identify which pair of means led to the establishment of significant difference the Scheffee' multiple comparison procedure was applied. It was found that the means of class one, a regular class, was significantly lower than for classes two, three, four, and five, two regular classes and two teleclasses. In summary, regular class one was found to be significantly lower in knowledge gained than the other four sections regardless of the version.

The descriptive summary of post test final scores is presented in Table 14. The range of means was from 71.07 to 87.24 with regular class one being the lowest and regular class three being the highest. Mean scores of regular class two and teleclass four were identical.
Table 14.--Descriptive Summary of the Post test of Final Examination Scores by Class Section

<table>
<thead>
<tr>
<th>Type by Class</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regular Class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1</td>
<td>21</td>
<td>71.07</td>
</tr>
<tr>
<td>Class 2</td>
<td>28</td>
<td>78.57</td>
</tr>
<tr>
<td>Class 3</td>
<td>21</td>
<td>87.24</td>
</tr>
<tr>
<td>R Total N</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td><strong>Telecourse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 4</td>
<td>21</td>
<td>78.57</td>
</tr>
<tr>
<td>Class 5</td>
<td>23</td>
<td>82.93</td>
</tr>
<tr>
<td>T Total N</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

The ANOVA procedure was applied to test for significance and significant differences by class section were established ($F (4, 117) = 16.44, p < 0.00$). The results are presented in Table 15. Next, the Scheffe' multiple comparison procedure was applied to investigate pairs of means. Group one, a regular class, had a significantly lower mean than the other regular classes and the two telecourses. In addition, class three (a regular class) had a significantly higher mean than that of regular class one and of a teleclass four. It should be remembered that the entry level means tested at the beginning of the class did not differ significantly.
Table 15.--ANOVA Summary Table for Post test of Final Examination Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among</td>
<td>4</td>
<td>3489.62</td>
<td>872.40</td>
<td>16.44</td>
</tr>
<tr>
<td>Within</td>
<td>117</td>
<td>6207.10</td>
<td>53.05</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>9696.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional Research Question 2

The second additional research question was whether there would be a significant difference by class section in the amount of attitude change. Pretest ATDP scores by class section are presented in Table 16. The means ranged from 61.38 to 65.13. Statistical equivalence across sections was established by ANOVA testing. Refer to Table 17 for presentation of the statistics.

Table 16.--Descriptive Summary of Pretest ATDP Scores by Class Section

<table>
<thead>
<tr>
<th>Type by Class</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1</td>
<td>21</td>
<td>61.38</td>
<td>5.39</td>
</tr>
<tr>
<td>Class 2</td>
<td>28</td>
<td>62.68</td>
<td>3.19</td>
</tr>
<tr>
<td>Class 3</td>
<td>29</td>
<td>63.21</td>
<td>4.30</td>
</tr>
<tr>
<td>R Total N</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecourse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 4</td>
<td>21</td>
<td>61.90</td>
<td>5.39</td>
</tr>
<tr>
<td>Class 5</td>
<td>23</td>
<td>65.13</td>
<td>5.63</td>
</tr>
<tr>
<td>T Total N</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANOVA was applied to test for significance and $F(4, 117) = 2.07$ ($p = 0.09$).

Thus, the means were statistically equivalent by section.

Table 17.--ANOVA Summary Table of Pretest ATDP Scores by Class Section

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among</td>
<td>4</td>
<td>187.77</td>
<td>46.94</td>
<td>2.07</td>
</tr>
<tr>
<td>Within</td>
<td>117</td>
<td>2654.24</td>
<td>22.69</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>2842.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For comparing the post test ATPD scores by class section the descriptive summary is presented in Table 18. The means ranged from 61.76 to 64.13.

Table 18.--Descriptive Summary of Post test ATDP Scores by Class Section

<table>
<thead>
<tr>
<th>Type by Class</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1</td>
<td>21</td>
<td>61.86</td>
<td>5.81</td>
</tr>
<tr>
<td>Class 2</td>
<td>28</td>
<td>62.54</td>
<td>4.76</td>
</tr>
<tr>
<td>Class 3</td>
<td>29</td>
<td>63.83</td>
<td>4.65</td>
</tr>
<tr>
<td>R Total</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecourse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 4</td>
<td>21</td>
<td>61.76</td>
<td>4.91</td>
</tr>
<tr>
<td>Class 5</td>
<td>21</td>
<td>64.13</td>
<td>6.32</td>
</tr>
<tr>
<td>T Total</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total N</td>
<td>122</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The null form of the question was tested by ANOVA with the summary of the statistics given in Table 19. The resulting $F(4, 117) = 1.02$ and there was a failure to reject the
null form of the question (p = 0.40). Thus, the means by class section varied by chance and chance alone.

Table 19.--ANOVA Summary Table for Post test ATPD Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among</td>
<td>4</td>
<td>113.52</td>
<td>28.38</td>
<td>1.02</td>
</tr>
<tr>
<td>Within</td>
<td>117</td>
<td>3252.09</td>
<td>27.80</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>3365.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary of Additional Research Question Testing

In total, two additional research questions were tested. Regarding the attitude domain, no entry level or change in attitude differences were found across class sections. Regarding the knowledge domain, no entry level differences were found across class sections. There was, however, a significant difference found in knowledge gained with one live version class section found to have significantly less gain and another live class section found to have significantly higher gain on the post test of the final examination.

Summary of Description of the Data

In Chapter 4, data obtained by the research were described. The sample of 122 students, 78 in the live class version and 44 in the teleclass version were distributed over three live class sections and two telecourse sections. Knowledge gained and attitude change were compared both by class version and by class section. No significant difference was found in knowledge gained by class version but there was a significant difference by class section with one live class section showing significantly less gain and another live class section showing significantly more gain. There was no significant difference in attitude change by class version or class section. Summary, analysis, conclusions and recommendations will be presented in Chapter 5.
CHAPTER 5
SUMMARY, ANALYSIS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The problems addressed by the research, the search results, and the procedures employed are summarized in this chapter. Research results are reviewed and analyzed, conclusions are drawn and recommendations are made for future research. A summary completes the chapter.

Review of Purposes

Because of the paucity of research studies comparing knowledge gain in special education and attitude change toward persons with disabilities as result of taking either a live or a telecourse version of a special education course, special educators could not rely on a search of the literature to guide them in decision making on whether to offer telecourse versions of their live courses. To address that need, this research study was designed to address the following questions:

1) To determine whether there is a significant difference in the amount of knowledge gained as a result of taking the telecourse version of SPED 510 (Survey of Exceptionalities) as compared to taking the live class version.

2) To determine whether there is a significant difference in change of attitude toward students with disabilities as a result of taking the telecourse version of SPED 510 as compared to taking the live class version.
Additional Findings

An additional finding emerged from the search of the literature that was not addressed by the two research questions and the hypotheses. It was clearly evident that the quality of both curriculum content and instruction was a significant factor in learning, whether the version used was a live version or a telecourse version. It was decided, therefore, to address two additional questions: 1) whether knowledge gained differed by class section, and 2) whether attitude change differed by class section.

Review of the Search of the Literature

Gain in Knowledge

That there is no significant difference between telecourse and live class versions regarding knowledge gained was the finding across comparative studies involving higher education between 1952 and 1993. Included were non random and random assignment studies. Interactive telecourses also yielded the no difference in knowledge gained finding (Hackman & Walker, 1990; Keck, 1992; Krohn, 1981; Pultorak, 1992; Ritchie & Newby, 1989; Russell, 1992; Russell, 1993; Silvernail & Johnson, 1990; Walker and Hackman, 1992).

Change in Attitude

Mixed results characterized the outcomes reported on attitude change toward persons with disabilities as a result of taking telecourse or live courses between 1973 and 1986. Only four studies comparing telecourse versus regular class versions of courses, using the Attitude Toward Disabled Persons Scales (Yukor, Block & Young, 1966) to measure the change, were usable. The studies differed greatly in their procedures, making comparison difficult. Results were claimed to be variously impacted by independent variables; e.g., age and sex. No conclusion about comparable results or the impact of demographic independent variables emerged from the attitude change literature review. One study
concluded that entry level attitudes of persons taking courses now are more positive than entry level attitudes of students two decades ago (Pilkington, 1984).

Review of Research Procedures

Six research hypotheses for comparing live and telecourse versions were tested. For the null forms of the six hypotheses comparing the means of the telecourse versus the means of the regular classes, the t-test with p.<0.05 was used. Two additional research questions that compared the class sections were addressed. For the null forms of the two questions comparing the means of the class sections, the ANOVA procedure was used and if differences were found the Scheffee' procedure was used to compare means.

Review of Research Results for Comparison of Versions

Attitude Change

The mean pretest ATOP scores of students in the regular version of the course were not significantly different than those of the telecourse students (Hypothesis 2). There also was not a significant difference in the mean post-test ATOP scores of students enrolled in the regular class sections and those enrolled in the telecourse sections (Hypothesis 5). The mean scores both at entry (62.91) and at post test (62.59) indicated that students in the sample see students with disabilities as different.

Knowledge Gain

Midterm Knowledge Scores

Students in the regular class sections did not differ significantly from students in the telecourse sections on the pretest of the midterm examination (Hypothesis 1). There also was no significant difference in the mean post test of the midterm examination scores between the telecourse versus regular class sections (Hypothesis 4). There was gain in knowledge in both versions.
**Final Examination Knowledge Scores**

There was no significant difference between the mean pretest of the final examination scores of students enrolled in the regular classes versus those enrolled in the telecourse classes (Hypothesis 3). No significant difference was found in the mean post final examination scores by instructional modality (Hypothesis 6). There was gain in knowledge in both versions but no significant difference by version.

**Summary of Research Results for Comparison of Versions**

For attitude change, entry level scores were equivalent. No significant amount of change occurred in either version nor was there a significant difference across versions. In knowledge scores, entry level scores were equivalent across versions. Growth in knowledge occurred across both versions but no significant difference in amount of knowledge gained was found across versions.

**Review of Research Results for Comparison of Class Sections**

**Attitude Change**

All entry level attitude scores were statistically equivalent by class section (Tables 14 and 15). Scores ranging from 51 to 74 indicated that SPED 510 students view students with disabilities as different from other students. No significant change in attitude differences were found across class sections (Tables 16 and 17).

**Knowledge Gain**

Entry level pretest scores both on the midterm and final examination did not differ significantly, meaning that students were equivalent in knowledge on entry. There was, however, a significant difference in knowledge gained by section with live class one showing significantly less growth and live class three showing significantly higher growth than all other classes.
Summary of Additional Research Questions Testing

Two additional research questions were investigated in which class sections were compared for knowledge gain and attitude change without regard to the versions (live or telecourse). There were no significant differences by class section in attitude change but there was a significant difference in knowledge gained by class section with live version class one performing significantly lower and live version class three performing significantly higher even though all students were found to be equivalent in knowledge on entry to the course.

Review of the Results of the Demographic Survey

Demographic Variables

Sex of the student was identified by some attitude change literature as a significant variable (Connie, 1969; Siller & Chapman, 1963; Higgs, 1975). Because 82 percent of the 122 student sample were female it was deemed inappropriate to analyze the data for sex differences. Further, the only claims for sex difference significance were made before 1975, whereas no difference findings were reported more recently (Donaldson, 1976; Lazar, Orpet & Denos, 1976; Pilkington, 1984; Yukor & Block, 1986). Contact with a person with disabilities also had yielded mixed results in the attitude change literature as had the age of the student (Yukor & Block, 1986). Because very few students taking SPED 510 had previous contact with persons with disabilities when a pilot demographic survey was conducted in the fall of 1993, the question was omitted on the demographic survey used for this research. Age of the students was identified but since the preponderance clustered around 30.00 years of age it was deemed inappropriate to test for significant differences. The fifty percent split between graduate and undergraduate students was shown not to be a factor by the no difference finding in entry level pre knowledge and pre attitude scores. The final demographic variable, suburban versus urban student, proved aberrant because 84.5 percent of the students live in the suburbs
with the remaining divided evenly between rural and urban. In summary, no demographic variable could validly be tested for significance in this study.

Reasons for Opting for the Telecourse or Live Course Versions

Demographic question, "Why did you select the version identified in question 6?" was not sufficiently discriminating to be applicable when deciding how many sections of each version to offer in each semester. For example, 16.7 percent of regular version students and 58.2 percent of telecourse students recorded "scheduling" as the reason for their selection. It was not clear whether the scheduling of the class or their own schedule was the reason for selection nor was it clear whether they would have taken the other version had it been scheduled on the same day and time. It does appear that two categories of replies by regular class students could be combined; i.e., "personal preference" (31.9 percent) and "class discussion and interaction" (16.7 percent) which would result in 48.6 percent of those in the live version clearly preferring the live version. Only 25.6 percent of telecourse students named "convenience and flexible time." In summary, in order to cater to student preference, it is important to continue the live version of the course each semester even if there is no difference in knowledge gained and attitude change between the two modalities. Students who can take the live version believe that they prefer it. One of the goals of our program is to cater to student preference as well as their needs as long as we can afford to do so.

Conclusions

On the basis of the findings of this research, the following conclusions were drawn:

1. There is no significant difference in the amount of knowledge gained as a result of taking the telecourse version of SPED 510 (Survey of Exceptionalities) as compared to taking the live class version.

2. There is no significant difference in the amount of knowledge gained as a result of taking a telecourse version of most higher education courses as compared to taking
the live class version.

3. There can be a significant difference in the amount of knowledge gained from one class section to another regardless of whether they are live or telecourse versions of a course, depending on how effectively the class is being taught and the quality of the curricular content.

4. There is no significant difference in the change of attitude toward students with disabilities as a result of taking the telecourse version of SPED 510 as compared to taking the live class version.

5. Attitudes toward persons with disabilities may not change significantly as a result of taking a survey course in special education.

6. Student preference dictates that both live and telecourse versions of classes continue to be offered each semester.

Recommendations

Based on the findings of this research, the following recommendations were evident:

1. In order to cater to student preference, both the live and the telecourse versions of SPED 510 should continue to be offered each semester.

2. Great care should be taken when offering more than one class section of any higher education course to ensure an equally high quality of instruction and curricular content for each class section.

3. When designing curriculum for special education survey courses, the designer should emphasize the knowledge component of the curriculum content. Attitude change seems unlikely to occur as a result of taking a course that emphasizes differences.

4. The knowledge tests now in use should be rewritten to be more discriminating. For example, entry level knowledge was higher than one would expect.

Suggestions for Further Research

Based on the findings of this research the following research needs were identified:
1. The findings of this research project should be revalidated by similar research with other special education courses, expanding into the junior college and four year institutions. The research in special education also should be expanded into core courses of masters programs.

2. The reasons for greater knowledge gain in some class sections of SPED 510 should be investigated to ascertain what superior instructors are doing differently. Taping class sessions and examining methods, materials and content may be helpful in clarifying exemplary practices.

3. Performance of students being taught by the instructor whose students significantly outperformed the others should be assessed for several semesters to ascertain whether the higher performance occurs each semester.

4. Attendance at class sessions should be compared across sections and versions for SPED 510.

5. Since the telecourse also is being used by a Community College in Memphis, Tennessee, it appears that the telecourse is successful at the freshman and sophomore level as well. It should be ascertained what that institution sees as the strengths, non strengths and needs of the telecourse for that level.

6. Students both at GSU and at the Shelby State Community College in Memphis should be surveyed to determine what they see as strengths, non strengths, and needs for change for the telecourse.

7. Why students have selected the teleclass version of the SPED 510 course should be investigated; e.g., what percentage of students selecting the telecourse would have selected the regular version instead if it had been offered at the same time and location. What percentage take the telecourse by preferences as compared to the percentage that must take the telecourse.

8. Whether the requirements to attend six class sessions and to take examinations at a
specified location prevent some would be students from taking the course should be investigated.

9. Whether students taking the telecourse version of the course would continue to perform equally well if there were no class meetings and examinations and if examinations, papers and field experience reports were mailed in should be investigated.

10. Whether there are differences in outcomes when regular education students who have taken the GSU SPED 510 telecourse take the state certification tests should be investigated.

Summary

This research project was designed to provide additional evidence to help special educators decide whether to offer telecourse versions of their live courses. The efficacy of the telecourse option was confirmed both through the search of the literature and by the finding of no significant difference in the amount of knowledge gained or in change of attitude between the telecourse and live versions of the course. The project was expanded to compare outcomes in knowledge and attitude change between class sections without regard to instructional mode. It was found that one live class section performed significantly lower in knowledge gained while another live class section performed significantly higher. No differences were found in attitude change. Suggestions were made for further action and research. As the diversity of student needs continues to grow, it is increasingly necessary for universities to provide greater options for taking courses. Providing telecourse versions of live courses was shown to be a highly viable option.
APPENDIX 1

GOVERNORS STATE UNIVERSITY
COLLEGE OF EDUCATION/DIVISION OF EDUCATION
COURSE SYLLABUS

Course Title: Survey of Exceptional Students
Course Number: SPED 510
Credit Hours: 3.0
Instructor:

Catalog Description:

Offered in both lecture and televised formats, introduces study of various exceptionalities, including learning disabilities and their impact on classroom learning. Focuses on methods for mainstreaming exceptional children and considers legal requirements, policies, and directions in special education. Requires fifteen clockhours of fieldwork.

Text:


Rationale:

All applicants for Early Childhood, Elementary, High School or Special certificates are required to complete coursework equivalent to three (3) semester hours in the psychology of exceptional children, identification of exceptional children, and methods of teaching exceptional children. This requirement reflects the current emphasis on integrating exceptional students into the regular education program to the highest degree possible. Practically all elementary and secondary school teachers can expect to assume shared responsibility for the education of exceptional children in their classrooms.

[58]
Intended Audience:
Preservice teachers, teachers, support personnel; undergraduate and graduate

Expected Student Outcomes:

The student will be able to:

1. Compare the various models of special education services (including consultation, resource, instructional, co-teaching, inclusion.)
2. Consider the implications of the least restrictive environment (LRE) and Regular Education Initiative (REI) concepts for the future of children and youth with disabilities.
3. Review pertinent legislation that has contributed shifts in educational practices.
4. Compare strategies of implementing IEPs in the regular classroom
5. Discuss the evolution of current special education laws, practices and trends.
6. Analyze issues related to causation, identification, prevention, instruction, and use of teaming assistive technology regarding children with special learning needs.
7. Identify needs of children with disabilities.
8. Evaluate programs provided for exceptional individuals.
9. Identify and describe "what is special" in special services for various handicapping conditions.
10. Compare the similarities and differences in learning behavior among the physically handicapped, learning disabled, educable mentally handicapped behavior disordered and other exceptionalities.
11. Analyze the impact of learning, social, physical, emotional, and cultural differences of individuals with exceptionalities on individuals, their families, and communities.

Instructional Activities:

Related Objectives
The student will:

#1, #4, #6, #7, #8, #9, #10, #11
1. Visit three different types of special education programs in different areas of exceptionality. (15 hours) (Selections must be approved by your instructor.)

#1, #5, #9, #10, #11
a. Submit a typewritten report on each of three (3) visits, including the following: identification of the site, type of handicap, description of physical environment and emotional climate, descriptions
of lesson(s) observed, method(s) of maintaining on-task behaviors, comparison of characteristics mentioned in the textbook with those observed and a summary listing of positive aspects along with those which need improvement. (Be certain to include your personal reactions to the experience.) **30 points** (10 points each). (Minimum of four (4) pages.)

b. Submit a verified report of your visits (Up to 15 clock hours will apply toward the 100 clock hours of pre-student clinical experiences required for certification in either elementary education of special education.) The field experience is a requirement of the course. (Copies of the form may be obtained at the orientation meeting or at the Division of Education office).

All objectives 2. Submit a research (referenced) paper on a topic approved by the instructor. Use at least five (5) references. Submit typewritten and in APA style. Minimum of ten (10) pages. **20 points.**

All objectives 3. Midterm exam (20 points). Final exam (25 points).

**Components of Research Paper**

1. Title page
2. Introduction
3. Discussion using each source referenced, **(heart of the paper)**
4. A summary of the above, usually one paragraph
5. A closing paragraph stating your reaction/opinion
6. A list of references in APA style (see bibliography for model)

*Your own opinion does not belong in this section

**Last name of source with the date of their work in parens. Ex: Jones and Smith (1975) believe that ...

**...all exceptional people are people first and exceptional second (Kirk and Gallagher, 1986).
All objectives 4. Participate in class meetings, small group activities, and whole class discussions. 4 points

All objectives 5. Complete two (2) examinations based on the textbook, handouts, and class sessions. Total of 50 points

Degree of Emphasis  Topical Outline

10% I. Overview: Who is the exceptional child? Changing perspectives, history of educating exceptional children, current directions, policies, mandates, service options, prevalences, and environmental influences.

30% II. Service principles and issues
   Individual differences
   Assessing exceptional children
   Special education instructional adaptations, individualizing, teaming, inclusion collaborative consultation, mainstreaming
   Regular education and special education interactions
   Multicultural considerations

60% III. The exceptionalities, characteristics and methods:
   gifted and talented
   mentally retarded
   visually impaired
   hearing impaired
   communication impaired
   behaviorally impaired
   learning disabled
   multiply, severely, and physically handicapped autistic
   traumatic brain injured
### APPENDIX 2

**SPED 510 TELECOURSE TAPES**

<table>
<thead>
<tr>
<th>Tape 1</th>
<th>Introduction to Special Education</th>
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<tbody>
<tr>
<td>Tape 2</td>
<td>Legislation, Rules and Regulations</td>
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<td>Tape 3</td>
<td>Least Restrictive Environment</td>
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<td>Making the Placement</td>
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<td>Individualized Educational Program</td>
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<td>Behavior Disorders Methods</td>
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<td>Issues on Educating the Gifted</td>
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<td>Early Childhood Special Education</td>
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<td>Tape 24</td>
<td>Other Issues and Summary</td>
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</table>

[62]
### APPENDIX 3

#### ATDP-0

Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one. Write +1, +2, +3: or -1, -2, -3: depending on how you feel in each case.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 1. | Parents of disabled children should be less strict than other parents. | +3: I AGREE VERY MUCH |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 2. | Physically disabled persons are just as intelligent as nondisabled ones. | +2: I AGREE PRETTY MUCH |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 3. | Disabled people are usually easier to get along with than other people. | +1: I AGREE A LITTLE |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 4. | Most disabled people feel sorry for themselves. | -1: I DISAGREE A LITTLE |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 5. | Disabled people are the same as anyone else. | -2: I DISAGREE PRETTY MUCH |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 6. | There should not be special schools for disabled children. | -1: I DISAGREE VERY MUCH |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 7. | It would be best for disabled persons to live and work in special communities. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 8. | It is up to the government to take care of disabled persons. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 9. | Most disabled people worry a great deal. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 10. | Disabled people should not be expected to meet the same standards as nondisabled people. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 11. | Disabled people are as happy as nondisabled people. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 12. | Severely disabled people are no harder to get along with than those with minor disabilities. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 13. | It is almost impossible for a disabled person to lead a normal life. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 14. | You should not expect too much from disabled people. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 15. | Disabled people tend to keep to themselves much of the time. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 16. | Disabled people are more easily upset that nondisabled people. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 17. | Disabled people cannot have a normal social life. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 18. | Most disabled people feel that they are not as good as other people. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 19. | You have to be careful of what you say when you are with disabled people. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 20. | Disabled people are often grouchy. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
APPENDIX 4

ATDP-0

Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one. Write +1, +2, +3: or -1, -2, -3: depending on how you feel in each case.

+3: I AGREE VERY MUCH
+2: I AGREE PRETTY MUCH
+1: I AGREE A LITTLE
-1: I DISAGREE A LITTLE
-2: I DISAGREE PRETTY MUCH
-3: I DISAGREE VERY MUCH

1. Parents of children with disabilities should be less strict than other parents.
2. Physically disabled children are just as intelligent as nondisabled ones.
3. Disabled children are usually easier to get along with than other children.
4. Most disabled children feel sorry for themselves.
5. Disabled children are the same as anyone else.
6. There should not be special schools for disabled children.
7. It would be best for disabled persons to live and work in special communities.
8. It is up to the government to take care of disabled persons.
9. Most children with disabilities worry a great deal.
10. Disabled children should not be expected to meet the same standards as nondisabled people.
11. Disabled children are as happy as nondisabled ones.
12. Severely disabled children are no harder to get along with than those with minor disabilities.
13. It is almost impossible for a disabled child to lead a normal life.
14. You should not expect too much from children with disabilities.
15. Disabled children tend to keep to themselves much of the time.
16. Disabled children are more easily upset than nondisabled children.
17. Disabled children cannot have a normal social life.
18. Most children with disabilities feel that they are not as good as other people.
19. You have to be careful of what you say when you are with children with disabilities.
20. Children with disabilities are often grouchy.
II. **Multiple Choice** (1/4 point each, 5 points total) Circle the letter next to the correct answer.

1. "Phonology" can be defined as:
   a. construction of sentences  
   b. sound combinations  
   c. patterns of language use  
   d. construction of word forms

2. The most integrated intervention for an exceptional student would be:
   a. with consultation from a special educator  
   b. when provided with an itinerant services provider  
   c. with a resource teacher  
   d. in a regular classroom

3. Before eligibility is determined, a regular teacher is expected to:
   a. make maximum effort to accommodate individual students’ needs  
   b. refer probable candidates needing special education for evaluation  
   c. communicate concerns with parents or guardians  
   d. all of the above

4. In special education, REI stands for:
   a. radical educational instruction  
   b. really emotional involvement  
   c. regular education initiative  
   d. regular exceptional initiative

5. Syntax refers to the construction of
   a. sentences  
   b. punctuation  
   c. word forms  
   d. verb tenses
6. The meanings of words and sentences are called:
   a. morphology
   b. pragmatics
   c. syntax
   d. semantics

7. The integration of handicapped students into some general education classes is known as:
   a. integration
   b. segregation
   c. mainstreaming
   d. full inclusion

8. Advocates of mainstreaming have used the following argument:
   a. mainstreaming does not require segregation of handicapped students from their peers
   b. mainstreaming is not a cost effective means of providing and education to handicapped students.
   c. mainstreaming is an effective means of promoting competition between handicapped and non-handicapped students
   d. pull out programs are the most effective

9. Known causes of mental retardation have most often been associated with:
   a. milder forms of mental retardation
   b. milder handicaps
   c. severe of profound levels of mental retardation
   d. moderate retardation

10. Retarded children’s academic underachievement is primarily related to:
    a. intelligence
    b. arithmetic computation
    c. manuscript
    d. reading comprehension

11. The overall goal of all preschool programs for mildly retarded children is:
    a. improving parents’ teaching skills
    b. reducing the probability the children will be classified mentally retarded when they enter elementary school
    c. improving family financial status by job training for parents
    d. improving the quality of the children’s medical care
12. Deficits in a student's ability to perceive and interpret stimuli are associated with:
   a. I.Q. - achievement discrepancy
   b. central nervous system dysfunction
   c. emotional disturbance
   d. psychological processing

13. The individual credited with the first use of the term "learning disabilities" during a meeting of parents in the early 1960's is:
   a. Samuel Howe
   b. Samuel Kirk
   c. Marianne Frostig
   d. Samuel Orton

14. Which factor is NOT a primary cause of a learning disability:
   a. central nervous system dysfunction
   b. environmental disadvantage
   c. minimal brain dysfunction
   d. perceptual handicaps

15. The following is an indicator of language problems:
   a. struggling to say words
   b. speaking in monotone
   c. word substitutions
   d. unusual pattern of stressing words

16. Individuals in minority ethnic groups are more apt to be identified as disabled because:
   a. they don't use eye contact
   b. they don't communicate effectively
   c. their differences are not adequately understood and valued
   d. their differences make them appear to be unable to function independently within the society

17. When children are enrolled in a regular classroom but are seen by a special education teacher for under 50% of the day they have been placed in:
   a. resource program
   b. itinerant program
   c. self-contained class
   d. special school

18. A written behavior contract should always include:
   a. feedback from the teacher
   b. rules of the classroom
   c. behaviors not to be performed
   d. behavior to be performed
19. In almost all cases the question of what caused a child to have E/BD is:
   a. biologically based
   b. family-related
   c. unknown
   d. school based

20. The average child with E/BD is:
   a. well liked by peers
   b. in the dull-normal range on IQ
   c. withdrawn
   d. likely to outgrow the problem

III. True/False (1/4 point each, 2 points total)

1. Public Schools may choose NOT to provide education for some children.
   a. True
   b. False

2. All communication disorders involve disorders of speech.
   a. True
   b. False

3. The most important characteristics of exceptional children are their abilities.
   a. True
   b. False

4. Normalization has as its goal making the lives of people with disabilities as much like the lives of nondisabled people as possible.
   a. True
   b. False

5. If a person achieves a low score on an I.Q. test, this means that his or her adaptive skills are also sure to be abnormal.
   a. True
   b. False

6. Retarded individuals go through different developmental learning stages than nondisabled individuals.
   a. True
   b. False
7. The learning-disabled student may have learning problems in school even though they may be no less intelligent than their peers.
   a. True
   b. False

8. Punishment may actually increase aggression under certain circumstances.
   a. True
   b. False

IV. Matching (1/4 point each, 6 point total)
Place letter from column on right on line at the left of term.

__ LRC  A. regular and special teachers plan together for student success

__ PL94-142  B. no child with a disability can be excluded

__ Conduct Disorders  C. a group excluded from BD/ED services

__ Collaboration  D. a conference at which eligibility is decided

__ Co-teaching  E. legal recourse for parents

__ Early intervention  F. individual educational program plan

__ SEA  G. Regular and special teacher teach together

__ Socially Maladjusted  H. local education association

__ LEA  I. a formal process that authorizes a CSE

__ Dyslexia  J. Placement to be made in the least restrictive environment in which the child can succeed

__ o-reject  K. special education services provided between 0-5 years

__ Referral  L. when a student can’t read

__ CSE  M. Public law passed in 1975 which mandated special education services to all children with handicaps

__ MDC  N. district effort to locate eligible children

__ Entry criteria  O. set by a district to determine eligibility

__ IEP  P. tests administered by a multi-disciplinary team

__ Child find  Q. state educational association

__ Due process  R. a synonym for socially maladjusted
Resource services

Full inclusion

Intra-individual variation

Perception

IQ-Achievement

Instruction services
  (self contained)

S. service to a child for under 50% of the school day

T. disturbances in interpreting visual and auditory stimuli

U. student exhibit variability within their own abilities

V. when a child is not achieving up to measured potential

W. service to a child for 50% or more of the school day

X. all special education students receive all services in the regular classroom
II. Multiple Choice (1/2 point each, 7 points total). Circle the letter next to the correct answer.

1. A speech disorder may refer to impaired:
   a. semantic development
   b. morphological development
   c. pragmatic development
   d. fluency development

2. Articulation disorders include:
   a. omissions
   b. substitutions
   c. distortions
   d. all of the above

3. The following is NOT true of language disorders:
   a. language has to do with the formulation and interpretation of meaning
   b. language involves listening, speaking, reading and writing
   c. language has to do with voice, articulation, and fluency
   d. a student with a language disorder may not make sense when talking

4. The specific effects of acquired hearing loss or brain injury depend upon:
   a. environmental conditions
   b. age of onset
   c. genetic history
   d. trace
5. Identification of speech and language disorders is the joint responsibility of:
   a. the child, the teacher, and the parents
   b. the teacher, the parents, and the speech-language pathologist
   c. the child, the parents, and the speech-language pathologist
   d. the child, the teacher, and the speech-language pathologist

6. Deafness that occurs after the development of speech and language is called:
   a. Adventitious
   b. Otosclerosis
   c. Congenital
   d. Postlingual

7. Due to poor speech quality and auditory comprehension skills, hard-of-hearing individuals have erroneously been diagnosed as:
   a. learning disabled
   b. mentally retarded
   c. emotionally disturbed
   d. autistic

8. The total communication approach utilizes:
   a. braille and manual communication
   b. sign language and a typewriter
   c. a telephone and a computer
   d. oral and manual communication

9. Professionals and parents are hesitant to mainstream hearing-impaired children because:
   a. it creates too much work for the regular teacher
   b. they do not get along with the other students
   c. they are not able to ride the bus
   d. they have difficulty with the English language

10. If a teacher suspects a hearing loss in a student, he or she should consult the:
    a. speech and language specialist
    b. school principal
    c. parents
    d. school counselor
11. As a disability of children, blindness is:
   a. one of the most prevalent
   b. about average in prevalence to other disabilities
   c. one of the least prevalent
   d. the worst disability to have

12. Defects that a child is born with are referred to as:
   a. primary characteristics
   b. congenital anomalies
   c. secondary problems
   d. acquired disabilities

13. A congenital midline defect resulting from failure of the bony spinal column to close completely during fetal development is known as:
   a. cleft spine
   b. spinal meningitis
   c. spina bifida
   d. cleft palate

14. A hereditary disease characterized by progressive weakness caused by degeneration of muscle fibers is:
   a. muscular dystrophy
   b. myopathy
   c. cerebra palsy
   d. atrophy

III. True/False (1/4 point each, 3 points total). Circle the letter next to the correct answer.

1. All communication disorders involve disorders of speech.
   a. True
   b. False

2. Any defect in the mechanisms of hearing and speaking can affect the development and use of speech and language.
   a. True
   b. False
3. Without functional language, one cannot truly become a social being.
   a. True
   b. False

4. The least common cause of childhood deafness is heredity.
   a. True
   b. False

5. An individual can belong to both a macroculture and a microculture.
   a. True
   b. False

6. Blind people have an extra sense that enables them to detect obstacles.
   a. True
   b. False

7. Blindness generally results in lower intelligence as well.
   a. True
   b. False

8. Cerebral palsy is usually a result a genetic factors.
   a. True
   b. False

9. German measles (rubella) is most likely to cause a deformity in the baby if the mother contracts the disease the first trimester of the pregnancy.
   a. True
   b. False

10. Some of the problems presented by giftedness parallel those presented by handicapping conditions.
    a. True
    b. False
11. Some people known as gifted have superior abilities of many kinds; others are clearly superior on only one area.

a. True
b. False

12. It is NOT important for a child with a disability to be a contributing member of the family.

a. True
b. False

IV. Fill in the blanks in the four (4) statements with a letter from the list below. (1 point each, 4 points total)

1. ___ is the academic area most affected by deafness.

2. ___ was the first post secondary school established for the hearing impaired.

3. ___ is a chronic respiratory condition characterized by difficulty in breathing.

4. ___ is the placing of a gifted student ahead of their age-peers.

   a. Math  e. Enrichment
   b. Gallaudet  f. Reading
   c. Spina bifida  g. Perkins
   d. Asthma  h. Acceleration
SS # ____________________________________________________________________

D1 Are you a graduate or an undergraduate student?

__ Graduate (have bachelors degree)
   What in? ___________________________________________________________

__ Undergraduate (do not have bachelors degree)

D2 Are you currently in a degree program at GSU?

__ Yes ______________________________________________________________
   What program?

__ No

D3 For what educational level are you preparing to serve in education?

__ Preschool __ primary __ intermediate

__ Middle/Jr. High __ High School

__ Other ____________________________________________________________________

D4 If you are preparing to teach a particular subject area, what is the subject:

_______________________________________________________________________

D5 If you are preparing to teach in special education, in which exceptionalities are you intending to be certified? ____________________________

_______________________________________________________________________

D6 Which version of SPED 510 are you now taking?

__ Television version __ Regular version
D7 Why did you select the version identified in question D6?

D8 Age:  
- 21-25  
- 26-30  
- 31-35  
- 36-40  
- 41-45  
- 46-50  
- 51-55  
- 56-60  
- 61-65  
- 66-70

D9 Sex:  
- M  
- F

D10 Home setting:  
- City  
- Suburb  
- Rural

D11 Why are you taking SPED 510? (Mark one)

- Required course for my ELED Bachelors degree
- Required course for my ELED Masters degree
- Required course for other degree
- To update lapsed certification
- Other

Please describe
REFERENCES


VITA

Jane Wilken Andringa was born on July 1, 1927 in St. Louis, Missouri. Raised overseas, she graduated from Lago Community High School in Aruba, Netherlands Antilles, in 1943. Ms. Andringa earned a Bachelors Degree in History from the University of Chicago in 1962 and taught Social Studies in Chicago, first at Beethoven Elementary School, then at Hyde Park High School one year. Between 1971 and 1973 Ms. Andringa worked as a substitute teacher in three suburban school districts. She completed a Masters Degree in Special Education at Chicago State University in 1975. In 1973 she began seven years of employment as a Special Education Resource Teacher in Harvey, Illinois, District 152, adding the role of Special Education Inservice Training Coordinator during the 1980-1981 school year. In the years 1978 to 1983 Ms. Andringa earned State of Illinois certification in Administration and Supervision, an endorsement as Administrator of Special Education and a Certificate of Advanced Study in Administration and Supervision from National College of Education. From 1981 to 1983 Ms. Andringa worked for the SPEED Special Education Cooperative, first as Technical Assistance Supervisor, then as Director Designee Supervisor for the 14 member districts. In 1984 she became a lecturer in Special Education at Governors State University in University Park, Illinois and, in 1987, was made a professor, being awarded tenure in 1992. She entered an Ed.D. program in Curriculum and Instruction at Loyola University of Chicago in 1987, and transferred to a Ph.D. program in 1991.

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The dissertation is, therefore, accepted in partial fulfillment of the requirements for the degree of Ph.D.

1/12/95
Date

[Signature]
Director's Signature