THE EFFECTS OF BEHAVIORAL OBJECTIVES AND VIEWING GUIDES ON LEARNING FROM INSTRUCTIONAL VIDEO TAPES

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ABSTRACT

The aim of the study was to determine whether learning would be enhanced by viewing video tapes with the aid of behavioral objectives and viewing guides, as opposed to viewing the same video tapes without these complementary aids. Subjects consisted of 172 first and second year students from two anglophone CEGEP's in Montreal. Two Physics tapes and two Nursing tapes were used for a total of 4 experimental situations. For each experiment, one group viewed the tape with the aid of objectives and a guide while the other viewed the same tape without any aids. An identical paper-and-pencil test was administered immediately after each viewing to measure short-term recall. The same test was also administered to a pure control group who simply took the test without any viewing. The results showed: first, that students who viewed video tapes with the aid of objectives and guides performed significantly better ($p < .01$) than students who viewed the tapes without these aids. This finding was consistently in the same direction across the four experimental situations. Further, both treatment groups performed significantly better ($p < .01$) than the control group in each of these four situations. Secondly, subjects in the Nursing experiments performed significantly better ($p < .01$) than subjects in the Physics area. Thirdly, a significant interaction was found ($p < .01$) between subject matter and treatment which indicated that Nursing subjects who viewed the tapes with the aid of objectives and guides performed better than subjects in other combinations. Lastly, a questionnaire designed to measure student attitude to viewing tapes with objectives and guides revealed that the majority of subjects exposed to this type of learning were generally favorable to the idea of using objectives and guides with video tapes. The findings seem to indicate that instructional video tapes, rather than standing by themselves, should be designed and used with introductory material and adjunct activities. Behavioral objectives and viewing guides would seem to be part of the optimum viewing conditions necessary for effective learning from video tapes.

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TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

LIST OF TABLES AND FIGURES

CHAPTER I

INTRODUCTION

1. CONTEXT OF THE PROBLEM

For many years, media research consisted for the most part in media comparison studies that, more often than not, yielded results of no significant difference (Allan, 1960; Saettler, 1968). The most that one could infer from these studies was that "extensive use of communications materials and media is at least as effective as conventional instruction " (Twyford, 1969, p.370). These global results often masked important underlying variables such as learner characteristics and other instructional design factors (Briggs, 1967). They also masked important formal differences between the different types of media. Further, they failed to indicate what conditions should accompany the use of media.

By contrast, the spirit of recent media research does not concern itself with an overall assessment of one medium as compared to another. Rather it looks at factors that are involved in using media in a particular instructional design (Lumsdaine, 1962). It seeks to determine those optimum learning conditions which should accompany the use of a particular medium or set of media. Media research design then will often consist of comparing the same medium across different combinations of adjunct conditions, in order to determine what the optimum conditions are for an effective use of that particular medium. This approach to media research follows the spirit of Gagné(1970) who emphasized the need to look at "the conditions of learning", those factors which must be present in the environment and in the learner so that the learner will respond and achieve a certain level of performance.

The specific medium researched in this study was that of video taped instruction. Campeau(1974) pointed out recently that media research has dealt very little "with cognitive achievement benefits

which might accrue from video taped instruction." Hence the need for research in this area. Further, Beisenherz(1972) pointed out that an attempt to improve research in ETV would be to examine those factors in the learning situation that might affect the behavior of pupils viewing television, factors that could aid in designing more effective video programs.

In this context of video research, this present study attempted to determine what the optimum conditions are for learning from video tapes. It attempted to do this by looking at the use of introductory material and adjunct activities as important factors in effective viewing of video tapes. It attempted to show that these two factors are part of the optimum conditions which should accompany the use of video tape for instructional purposes.

2. THE PROBLEM STATEMENT

The problem was to compare two approaches to viewing video tapes: the Package approach and the Tape-only approach.

In the Tape-only approach to viewing video tapes, the teacher usually gives a short verbal introduction. The students are neither encouraged nor discouraged to take notes while viewing. The result is that students often do not know what to look for in the presentation, nor do they interact with the material in any significant way. They remain for the most part passive receptors of audio-visual information, and one wonders if any significant learning is taking place.

By contrast, the Package approach to viewing video tapes makes use of introductory material prior to the viewing and an adjunct activity during the viewing itself. The introductory material states clearly to the student what he should be able to do after viewing the video tape. This can be achieved by providing a list of behavioral objectives. The adjunct activity encourages the student to interact

with the presented material by having him fill out a viewing guide while viewing the tape.

The problem statement then was formulated as follows:

> Does the use of introductory material and an adjunct activity in viewing video tapes result in more effective learning than viewing the same video tapes without introductory material or adjunct activity?

A secondary problem was to examine the extent to which the findings were generalizable: first, across different video tapes within a particular area and secondly, across different subject areas.

Two different video tapes from the Physics area and two from the Nursing area were used for the study. In this way, an attempt was made to determine the extent to which the findings were generalizable across different subject areas.

For each tape in a particular subject area, a treatment group viewed the tape with the help of introductory material and an adjunct activity. A second treatment group viewed the same tape without any added material or activity. (These two treatment groups will be referred to as the Package Group and the Tape-only Group respectively for the remainder of the thesis). A criterion test was administered to both groups, as well as to a third pure control group. The means of the groups were statistically compared to determine any significant differences. Further, immediately after the test, subjects in the Package Groups filled out a questionnaire designed to find out their general attitudes towards viewing video tapes with the aid of objectives and guides; the aim here was to show that, at the minimum, they would not be turned off by this type of learning.

3. SIGNIFICANCE OF THE STUDY

The significance of this problem for the field of media research lies in the fact that students today are exposed to many hours of film and video tape viewing as part of their course material. One hopes that we can maximize the amount of learning that can occur as a result of this viewing. One way to maximize this learning is to work out the

optimum learning conditions that should accompany the viewing of audio-visual material. To the extent that this study pointed out some of these conditions, it is extremely relevant and significant for the field of educational research in general and media research in particular.

Further, the significance of the study lies in the hope that it will lead to improvement in the instructional design of new video material - both at the local production level and at the level of national producers of educational material. Hopefully, any new video material in the future will have built into it those supplementary aids which this and other similar studies have indicated are essential parts for effective learning from instructional media.

Finally, this study fits into the field of "educational technology" as defined by Concordia University's graduate program in this area. This definition is modelled on the British National Council's definition of educational technology as "the development, application and evaluation of systems, techniques and aids to improve the process of human learning."* To the extent that this study developed, applied and evaluated a particular technique for learning from instructional video tapes, it follows the spirit of this particular meaning of educational technology.

4. OVERVIEW

This present chapter has presented the context of the problem along with the specific problem to be dealt with in this study. Chapter 2 which follows provides a review of related research in the areas of behavioral objectives and adjunct activities such as viewing guides. The hypothesis, the subjects, the instructional materials and the measuring devices appear in Chapter 3. The results of the study in both written and table form make up Chapter 4, while Chapter 5 provides the conclusions and makes recommendations for future research.

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* British National Council for Educational Technology, undated pamphlet circa 1971-72.

CHAPTER 2

REVIEW OF RELATED RESEARCH

1. Research on Instructional Television

Campeau (1974) has pointed out recently that there has been very little media research done in the area of instructional video tapes per se. Most of the research that has been done is closer to instructional television, where the bulk of the research has dealt with the relative effectiveness of televised lectures to live lectures. The conclusion here has usually been that students will most likely learn as much from a televised class as from a live class (Schramm, 1962). Stickell (1963), however, pointed out that most of these comparison studies suffered from an inadequate control of variables. Of the 250 studies he examined, he found only 10 "interpretable" ones and all 10 of these showed no significant difference between a televised class and a live class ($p < .05$). Stickell's critical review would seem to underline the impoverishment and futility of this broad comparison approach in instructional television. It is impoverished because it does not seem to have revealed any particular learning conditions that might improve the use of instructional television. Because the broad comparative approach has not done this over so many studies, it would seem futile to pursue this line of research.

In contrast to broad comparisons among media, some recent media research has been more concerned with examining and comparing factors in the learning situation that affect student response to a particular medium (Beisenherz, 1972). In this context, research on instructional television is concerned with determining what the optimum factors might be for learning from televised material. Indications are that some kind of initial orientation (Fields, 1971) followed by some type of interactive participation (Lavin, 1971; Beisenherz, 1971; McKeachie, 1967) are two important factors in the viewing conditions needed for optimum learning from audio-visual material. Initial orientation is often best provided by behavioral objectives which tell the students

what to concentrate on in the tape. Interactive participation can be provided by some kind of adjunct activity such as completing a viewing guide while viewing a tape.

2. Research On The Variables Within ITV Programs

In his survey of the research on variables within ITV programs, Schramm (1972) found that "in contrast to the hundreds of experimental comparisons of ITV with 'conventional' classroom teaching..., there are at most a few score of studies specifically on the content and strategies of ITV " (Schramm, 1972, p.45). In fact, the research reported deals more with instructional films than television programs. However, since both these media make use of audio and visual elements, the research on films is probably applicable to television.

Among the variables researched are pictorial quality, picture-sound relationships, simplicity and complexity of treatment and teaching strategies.

In dealing with pictorial quality, Schramm (1972) points out that the difference is not usually in "pictorial quality per se, but rather how the pictorial quality fits the learning goal " (p. 50). A close-up shot for example is not in itself better than a long-shot; it depends on the objective. If the objective is to show football formations, for example, long-shots are more effective than close-ups. On the other hand, if the objective is to show how the different parts of a micrometer work, then close-ups will obviously be more effective than long-shots. The focus of the educational producer should be on the learning goal and how to achieve it rather than attempt to deal with media questions in isolation. A second important point about pictorial quality is that although a certain aspect such as color may not enhance learning, it might still have an effect on liking a certain program and so may contribute to motivation.

In the area of picture-sound relationships, the recommended principles are based mostly on research conducted by Travers (1966). Travers and his colleagues concluded that if the rate of presentation is less than the capacity of students to process the information,

there is some advantage in using two channels; otherwise a single channel is sufficient. Further as the "complexity of the learning tasks increase, the advantage of using the visual mode increases " (Schramm, 1972, p.54).

As for simplicity-versus-complexity in treatment, the research shows generally "no learning advantage to be gained by a fancier, more complex treatment " (Schramm, 1972, p.55). As in the case of pictorial quality, embellishments, elaborate visuals, professional techniques, humor and animation have little advantage per se, but rather may have an advantage in how they fit the learning goals. If your goal is to change student attitude about a certain program, then a complex treatment might be more effective than a straight simple one.

Finally, in the research on teaching strategies, one of the most important areas has been "student participation in the teaching - learning process" (Schramm, 1972, p.58). The key thing about this research is the consistency of results. As Schramm points out, "in many forms, with many kinds of subject matter, active student participation has almost invariably been found to contribute a substantial amount to learning " (p.58). Further, the research indicates that ITV programs should be built into a "larger instructional time unit which will include a great deal of active student practice and application growing out of the televised lesson" (Schramm, 1972, p.59).

As for the structuring of this participation, Lumsdaine (1958) and Michael and Maccoby (1953) found that introducing student participation questions within a film was an inexpensive and easy way to revise films so that student participation would be built in without having to change the basic material of the program. Michael and Maccoby (1953) further found that although learning increased when an active response was elicited, it increased even more by giving knowledge of results. Angell (1949) also reported that immediate knowledge of results contributed more to learning than postponed knowledge of results. Again, Michael and Maccoby (1953) found that the best time to elicit a response is as soon as possible after the student has been given the information he needs to make the response.

Other teaching strategies which have been found to increase learning from ITV programs are: clear organization as provided by titles, subheadings and directional cues; repetition of material in a variety of forms (Lumsdaine, Sulzer, and Kopstein, 1961; Ash & Jaspen, 1953); programming occasional pauses during a presentation (Faison, Rose & Podell, 1955; Pockrass, 1961) - these pauses act as rest breaks and allow the viewer a chance to think about what he has just seen.

Research on the variables within ITV programs then has emphasized two points: simplicity of presentation and active participation by the students in the learning process. As Schramm (1972, p.67) puts it:

> "Effective television can be kept as simple as possible, except where some complexity is clearly required for one task or another; students will learn more if they are kept actively participating in the teaching-learning process. Simple television: active students."

To conclude this section then, it should be pointed out that this study was an attempt to examine a possible teaching strategy for ITV programs that would enhance student participation, namely the use of a learning package which the student uses while viewing the tape. The two key elements in this package are behavioral objectives and adjunct activities. Research on these two factors is, therefore, reviewed below.

3. Research on Behavioral Objectives

Duchastel and Merrill (1973) recently reviewed studies on the effects of behavioral objectives on learning and found generally inconsistent results. Some studies do show facilitative effects but "an equal number of studies have failed to demonstrate any significant difference."

Tiemann (1968) used behavioral objectives along with eight video tape lectures in a college economics course and found significant differences in favor of behavioral objectives for retention tests. Lawrence (1970) found the behavioral objective treatment significantly superior to other treatments in a unit on nursing care. Engel (1968) investigated the effects of behavioral objectives on achievement in

a unit of instruction in mathematics, and also found no significant differences in favor of objectives. However, Fowler (1973) found no significant difference between presenting performance objectives and not furnishing performance objectives to students in physical science lab work. Loh (1972), in measuring the effects of behavioral objectives on learning and retention in high school algebra, also found no significant difference between students who were informed of objectives and those who weren't. Further, Shields (1973), in studying the use of behavioral objectives in an audio-tutorial biology class, found that objectives do not significantly enhance achievement in such classes. On the other hand, Booth (1973) studied the effects of two types of instructional objectives on student achievement in a communications course and found that students provided with behavioral objectives scored higher than students provided with general objectives stated in non-behavioral terms. Taylor (1973) investigated the use of inferred objectives with non-objectives based instructional materials and found that providing objectives to students, prior to presenting instructional materials not based on objectives, facilitates student performance. Duchastel and Gonzalez (1974) recently found that providing orienting stimuli to students, prior to reading a prose passage, increased relevant learning in free recall tests though not in recognition tests.

There are three important points to underline in these recent empirical studies on behavioral objectives. First, behavioral objectives seem to have the greatest effect on learning when the task is that of immediate retention or recall. This present study uses immediate recall as its dependent variable and hence follows this general trend. Secondly, in examining the factors which might account for the discrepancies in results, neither subject matter nor level of schooling seemed to have any effect on the consistency or inconsistency of the results. One of the hypotheses in this study is that subject matter will not significantly affect performance and so here too this study fits into recent findings. Thirdly, one of the most important conclusions that arises out of the empirical research on behavioral objectives is that behavioral objectives are not meant necessarily to be

used by themselves, but rather might be used along with other stimuli or activities to help enhance learning (Sulzen, 1973). Duchastel & Merrill (1973) emphasized the need to investigate the effects of behavioral objectives as they interact with other tasks in a learning situation. This present study attempted to do just this, by combining behavioral objectives with an interactive adjunct activity in order to study their combined effect on learning from instructional videotapes. The importance of studying combined effects lies in the fact that instructors are trying to maximize learning so that pointing out the optimum combination of available learning resources will be of benefit to their teaching. Further, there is the importance of looking at the multiplicative or possible cancelling effects of using various learning factors in combination.

4. Research on Adjunct Activities

Research on the role of adjunct activities in viewing audio-visual material goes back to World War II. Vernon (1946) studied filmstrip viewing with and without note-taking and found no clear advantage of one procedure over the other. Vandermeer (1950) found that subjects who had access to a study guide before and after viewing a film did significantly better in long-term recall than subjects who viewed the same film without access to a guide. Ash & Carlton (1951) compared a note-taking with a no-note-taking group and found that the latter did better on a factual information test. Lumsdaine, May & Hadsell (1958) evoked subject participation by splicing questions between sections of a stimulus film. They found that significantly more learning took place with the spliced version of the film than with the straight version. Howe (1970) showed that subjects who were allowed to review their notes did significantly better than the no review groups. Fields (1971) used teaching tests prior to viewing to sensitize subjects to films and found that visual review material contributes significantly to learning from televised lessons. Beisenherz (1971) found a significant difference between students exposed to a televised science program and those exposed to the

same program but with supplementary material. Further, McKeachie (1967) suggests that an emerging principle from film research is that participation was found to increase learning; this participation should be planned in the production of a film or video tape.

Lavin (1971) studied the relative effectiveness of three types of notes used as adjunct study activities to film viewing. Subjects were exposed to either blank outline notes, completed notes or plain paper notes for a series of eight films. The results indicated that the first two types of notes were superior to plain paper notes ($p < .14$) and that all three treatments were superior to the treatment in which subjects merely attended the film without the use of aids ($p < .05$). Lavin's study emphasizes the importance of learner participation techniques for group audio-visual instruction; however, his study did experience problems with excessive student absences and extreme variations in film-stimuli characteristics.

5. Conclusion

The bulk of this research emphasizes two important factors in viewing audio-visual material. One is the use of introductory material acting as an "advanced organizer" (Ausubel, 1969) to sensitize and orient students so that they will know what to look for in a presentation. The other factor is the importance of some kind of interaction with the material so that the student becomes an active participant rather than a passive receptor in the learning process. Rothkopf (1970) has shown in his studies on mathemagenic behavior that in most instructional situations "what is learned depends largely on the activities of the student" (p.326) The student's "inspection activities... determine what is learned" (p.326) Rothkopf (1966) asked students to respond to questions during the course of reading a prose passage and found that this adjunct activity shaped student attention and information-processing. Subjects who answered inserted questions did significantly better than a reading-only control group. The present study attempted to determine if Rothkopf's findings applied to viewing audio-visual material.

Further, certain methodological needs arise from recent research in this area. One is the need for pure control groups in order to establish base-lines for evaluating the effects of treatments. Secondly, there is the need to use instructional material that is more closely integrated into the course content followed by the subjects; this would attenuate distraction and novelty effects and make possible a higher level of motivation.

In addition to these methodological needs, certain replications and extensions are needed in this area. Most of the work on adjunct activities has been done using film as the instructional medium; there is a need to study the extent to which these recent findings apply to other media, such as video tapes. There is also the need to see if subject matter has any moderating effect on this kind of treatment. Last, but not least, new work is needed in this area especially as regards the cummulative effects of adjunct activities used with other learning factors such as behavioral objectives.

In the spirit of Campeau (1974) who emphasized the need to devote more effort to replication and follow-up studies, this present study followed up and extended Lavin's study (1971) on the use of adjunct activities in audio-visual instruction. First, this study attempted to determine if Lavin's findings regarding films were generalizable to video tapes. Secondly, it concentrated on one type of note-taking as opposed to three types. By using multiple stimuli and multiple treatments, Lavin seemed to have ended up with too many variables to control, so that one can question the validity of his results. By using a smaller number of variables, this study did produce more confident results. Thirdly, this study attempted to provide better controls for history, maturation and experimental mortality than did Lavin's. Fourthly, the present study also attempted to follow up Lavin's suggestions that a more heterogeneous sample be used and that a pure control group be part of the design. Lavin's subjects were mainly female chemistry students while the subjects in this study were both male and female from two different areas - physics and nursing; this study also used a pure control group for each of the four experimental situations.

Fifthly, by using material from two different subject areas, this study attempted to examine the extent to which subject matter might have a moderating effect on the treatment. Lastly, this study attempted to determine the extent to which Lavin's results applied to a different population -- English Cegep students as opposed to Chicago college seniors.

CHAPTER 3

METHODOLOGY

1. OBJECTIVES AND HYPOTHESES

As indicated above in the problem statement, the Package approach is defined as the use of introductory material and adjunct activities in viewing video tapes, while the Tape-only approach is defined as the viewing of video tapes without these aids.

The main objective in this study was to prove that the Package approach would result in more learning than the Tape-only approach. A second objective was to examine the extent to which the findings would be generalizable across different subject areas, while a third related objective was to examine the extent to which the video tapes themselves might have an effect on performance. The fourth objective was to study any possible interaction between subject matter and treatment. The fifth and final objective was to examine student attitude to the Package approach to viewing video tapes.

1.a OPERATIONAL DEFINITIONS OF THE VARIABLES

Introductory material: refers to a list of relevant behavioral objectives given to the student just before the actual viewing; this tells the student what he should be expected to be able to do after viewing.

Adjunct activity: refers to a detailed viewing guide with frequent spaces for student answers; the student is asked to complete this guide while viewing the tape.

Package approach: refers to the use of introductory material and an adjunct activity in viewing instructional video tapes.

Tape-only approach: refers to the typical way video tapes are viewed; there is a short verbal introduction by the teacher stating what the tape is generally about; students have the option to take or not to take notes while viewing; no viewing guide is provided.

Learning: refers to an increase in the ability to recall facts and ideas and the ability to make valid inferences i.e. use the facts and ideas to solve simple problems.

Subject matter: traditional areas of study and specifically in this case, physics and nursing.

Video tapes: short instructional tapes.

Attitude: student response to a written questionnaire where they are asked what they think about the Package approach to viewing tapes.

1.b HYPOTHESES

With the above terms in mind, the objectives were restated as the following hypotheses:

1) Students who view video tapes with the aid of a list of behavioral objectives and a detailed viewing guide will perform significantly better on a recall-and-inference test than students who view the same video tapes without these aids.

2) Subject matter will not significantly affect performance on the recall test.

3) Individual video tapes will not have a significant effect on performance.

4) There will not be any significant interaction between subject matter and treatment.

5) Students exposed to the Package approach will indicate via a questionnaire that, at the minimum, they are not turned off by this way of viewing tapes.

1.c RATIONALE FOR THE HYPOTHESES

The empirical justification for the main hypothesis in question lay in previous studies (Lavin, 1971; Fields 1971) which indicated that adjunct activities such as note-taking and completing viewing guides did result in more effective learning. The theoretical justification lay in the fact that relevant introductory material introduces concepts that act as "advanced organizers" for the major content of the instruction (Ausubel, 1969). These conceptual organizers can orient the student by showing him what to look for in a presentation. Further, there is the theory that effective learning is a function of relevant response modes that accompany learning (Tosti & Ball, 1969; Rothkopf, 1970). Consequently, asking a student to interact with the material in a relevant way while viewing should result in more effective learning simply because the student becomes an active participant rather that a passive receptor in the learning process.

2. SUBJECTS

The subjects for this study consisted of 172 students drawn from two English-speaking Cegeps in Montreal - Dawson College and Vanier College. Dawson College has been traditonally described as an inner city college catering to students who generally come from lower to middle-income families. Vanier College, on the other hand, is usually referred to as a middle-class college serving students from middle to upper-income families.

More specifically, 69 female second and third year Nursing

students with an average age of 21.3 made up the Nursing samples; 56 male and 47 female first year science students with an average age of 18.2 made up the Physics samples. No I.Q. or equivalent aptitude score was available for any of the subjects. The Cegeps on the whole do not keep a record of such scores. Further, according to the Assistant Registrar at Dawson, the Montreal school boards, which supply information about incoming students to the Cegeps, have been in the habit of blotting out the I.Q. scores from their files. Consequently, wherever possible, mid-term test scores or equivalent were obtained in order to check out the homogeneity of both treatment groups.

A. THE NURSING SAMPLES

Subjects were selected for two different video tapes within the Nursing area. Subjects for the Newborn tape (dealing with the examination of a newborn baby) were taken from the obstetrics course that forms part of the third year Nursing program at Dawson. Two intact groups of 14 students each were assigned to the two different treatments - one group viewing the tape with a guide (Package Group) while the other viewed the tape without a guide (Tape-only Group). A third group of 13 students from the complementary third year pediatrics course volunteered to act as pure control group. This group simply took the test without seeing the tape.

The sample for this first Nursing tape then numbered 41 in all. The mean age of the Package Group was 20.2, while the mean age of the Tape-only Group was 20.6; the third pure control group averaged 23.6. Since I.Q. scores were unavailable, scores on a mid-term test (given by the obstetrics teachers) were obtained. This was done to determine whether or not there was any gross discrepancy in normal classroom test performance between the two treatment groups. The Package Group had a mean of 70.5 on this mid-term test while the Tape-only Group had a mean of 75.3. These results seem to indicate a fairly even average for both groups. No scores were available for the third pure control group.

Subjects for the Traction tape (dealing with nursing care for patients in traction) were taken from the medical surgery course that forms part of the second year Nursing program at Dawson. In this case an intact class of 22 students was randomly divided into two groups of 11 students each. One group was assigned to the Package treatment while the second group was assigned to the Tape-only treatment. Only 6 subjects were available for the pure control group; these came from another section of the medical surgery course.

The sample for this second Nursing tape then numbered 28 in all. The mean age of the Package Group was 21.0 while the mean age of the Tape-only Group was 21.1; the third pure control group averaged 21.1. Unfortunately no mid-term test scores were available for these subjects. However, it is the one sample in this study that was completely randomly divided so that one can safely assume that there wasn't any gross discrepancy in intellectual capacity between the two groups. Randomization normally assures us of this conclusion.

B. THE PHYSICS SAMPLES

Subjects were selected for two different video tapes within Physics. Subjects for the Work tape (dealing with the concepts of work and energy) consisted of first year science students enrolled in Physics 102 at Vanier College. Physics 102 is an introductory physics course for students who have had basic physics in high school. Again, two intact classes of 19 students each were assigned to the two different treatments while 9 students from another section were assigned to the pure control group.

The sample for the Work tape then numbered 47 in all. The Package Group consisted of 11 males and 8 females with a mean age of 17.21; the Tape-only Group consisted of 6 males and 13 females with a mean age of 17.26. The pure control group consisted of 5 males and 4 females with a mean age of 16.7.

Again, since no I.Q. scores were available, average first term test scores were computed for all subjects in both treatment groups.

The Package Group had a mean of 74.0 on these tests while the second treatment group had a mean of 72.0. These results seem to indicate once again a fairly even average in classroom test performance across both groups. One can safely assume an equal intellectual capacity across both groups.

Subjects for the Newton tape (dealing with Newton's three laws of motion) were taken from first year science and technology students enrolled in a Physics 111 course at Dawson College. Physics 111 is an introductory course given to students who have not had basic physics in high school. Two intact classes of 23 students each were assigned to the two different treatments. In this case, since no other section of Physics 111 was available, the pure control group consisted of 10 students from a first year Math. course given to Arts students. These subjects represented the closest equivalence available to students with a non-scientific high school background.

The sample for this Newton tape then numbered 56 in all. The Package Group consisted of 13 males and 10 females, with a mean age of 19.1; the Tape-only Group consisted of 14 males and 9 females with a mean age of 19.3. The pure control group consisted of 7 males and 3 females with a mean age of 19.2.

Average first term test scores were computed for all subjects in both treatment groups. These scores revealed a somewhat gross discrepancy between the Package Group which had a mean of 54.8 and the Tape-only Group which had a mean of 72.0. It is difficult to compare these means since both groups each have different teachers who each gave different tests. Further investigation revealed that at least 4 subjects in the first treatment group were students with an obvious deficiency in the English language. Consequently, one cannot safely assume that both treatment groups were equal in intellectual capacity and average classroom test performance.

Table 1 on the following page summerizes the mean ages and scores of each group for each of the four tapes in this study.

In conclusion, it may be important to point out that (from the experimenter's viewpoint) the Nursing subjects on the whole seemed to

TABLE 1. SUMMARY OF MEAN AGES AND AVERAGE CLASSROOM PRE-EXPERIMENT TEST SCORES FOR EACH GROUP

TAPE	GROUP	NO. OF S's	MEAN AGE	MEAN SCORE
NEWBORN	PACKAGE	14	20.2	70.5
	TAPE-ONLY	14	20.6	75.3
	CONTROL	13	23.6	--
TRACTION	PACKAGE	11	21.0	--
	TAPE-ONLY	11	21.1	--
	CONTROL	6	21.1	--
WORK	PACKAGE	19	17.21	74.0
	TAPE-ONLY	19	17.26	72.0
	CONTROL	9	16.7	--
NEWTON	PACKAGE	23	19.1	54.8
	TAPE-ONLY	23	19.3	72.0
	CONTROL	10	19.2	--

be intellectually more mature than the Physics subjects. This is understandable since the Nursing subjects were second and third year students accustomed to the Cegep style of learning while the Physics subjects were first year students, fresh out of high school and perhaps unaccustomed to sudden changes in routine as this experiment was. On the whole the Physics subjects tended to be a little more disturbed by the experimental situation than the Nursing subjects and in one case (the Newton Package Group) the subjects did not seem to be taking the situation as seriously as the subjects in the other groups.

3. Instructional Materials

A. The Video Tapes

As indicated above, two different tapes in each of the Nursing and Physics subject areas were used for this study. Below is a brief description of each tape followed by important points to be made about these tapes.

i) Examination of a Newborn

This first Nursing tape deals with the examination of a newborn baby as conducted by a pediatrician. The doctor performs an actual thorough examination of a baby only a few hours old. A Nursing student is present with the doctor, observing his examination and asking pertinent questions about the newborn's color, reflex activity, breathing pattern, etc.

This tape was made on location at the Montreal General Hospital by Helen Russell of Vanier's nursing staff for use in their obstetrics course. Production help was provided by Vanier's A-V Centre. A portable video camera with microphone was set up in the examination room and simply recorded more or less in mid-shot and close-up the complete examination. The tape lasts about 40 minutes.

Pedagogically, this tape is a good example of one of the important uses of video, namely, to bring field work into the classroom. Obviously, it would be impossible and inconvenient to bring a whole

class into a pediatrics examination room. Video allows us to do the opposite by bringing a real life situation into the classroom. The viewer is witness not to a simulation but to a real examination of a real newborn baby. Further, the dialogue between the doctor and the Nursing student in the tape makes it a kind of two-way communication. The nursing student tends to ask those questions which are probably in the viewer's mind. Finally, the tape in itself would have been more effective with the insertion of graphic titles to divide up the key sections.

Technically, the tape fulfills the minimum requirements of having clear steady images and audible sound. Color, however, would have been nice to have for certain sections dealing with skin tone. Further, a few more extreme close-ups of various parts of the newborn's body would have made the tape even more effective.

ii) Nursing Care For Patients In Traction

The second Nursing tape deals with proper nursing care for patients in traction. The tape shows examples of patients in skin and skeletal traction. Nurses are seen in action changing the traction apparatus and providing good care for the patients.

This tape was made on location at the Jewish General Hospital by Bonnie Lee Smith (also of Vanier's nursing staff) for the orthopedics section of the Medical Surgery course. Production help was again provided by Vanier's A-V Centre. A portable video camera was again used mostly in mid-shot to record the action. This tape lasts about 20 minutes.

Pedagogically, the Traction tape is another good example of bringing fieldwork into the classroom. Students get a front-row view of various procedures in caring for patients in traction. Secondly, an important interactive element is built into the tape as viewers are asked to look at a sequence and determine if certain nursing objectives are being met.

Technically, the graphic representations of the different types of traction help the viewer grasp the live-action situations. Once

again, however, there is a lack of close-up shots that would have made this tape even more effective.

iii) Work, Energy & Power

While the Nursing material consisted of "training" tapes, the Physics material is closer to what might be called "conceptual" tapes. These do not aim to show students how to perform particular techniques, but rather aim to get certain verbal information and problem-solving skills across to them.

The first Physics tape deals with the concepts of work, energy and power as these are used in the physics sense. The tape covers roughly the following: definitions of work, energy and power; different kinds of energy and their relationship to work; the units of work, energy and power and sample problems making use of these units. A combined lecture-demonstration style is used by the teacher in the tape. Basic concepts are presented on an overhead projector, followed by concrete examples in the physics lab.

The tape was produced in the Physics lab at Vanier College by one of the Physics teachers, Hans Werneke, for use in his Mechanics course. The A-V Centre again provided the production help. This time two portable video cameras were used in conjunction with a video switcher in order to provide an instantaneously edited tape. This first Physics tape lasts about 40 mintues.

Pedagogically this tape is a typical example of the lecture-demonstration type of production where the camera simply records the lecturer as he presents his concepts and provides examples. There is unfortunately a lack of variety in his examples so that a certain amount of redundancy enters in. The section on Power, however, is especially interesting since once again an interactive element is built into the tape. In this case, a situation is acted out and students are asked to work out what power a body is exerting when it performs a certain type of work.

Technically, the quality of the tape does suffer to a certain extent because of the simultaneous use of two portapak cameras with

a random sync. The result is that some of the edits are not as clear and steady as they should be.

iv) Newton's Laws

The second Physics tape deals with Newton's three laws of motion. As in the Work tape, a lecture-demonstration style is used to present each of Newton's three laws, with concrete examples for each law. The teacher in the tape provides examples of everyday situations where Newton's laws apply and then uses the chalk-board to work out the concepts and formulas that are present in these situations.

Again, this tape was produced in the Physics lab at Vanier College by Don Hetherington for the Mechanics course. A two-camera set up similar to the Work tape was used. This particular tape lasts about 25 minutes.

Pedagogically, this Newton tape is a good example of the attempt to present scientific information in an interesting manner with a well-balanced use of lecturing, graphic inserts, concrete examples, anecdotal material and humor. Technically, there is the same problem with some of the edits as in the Work tape due to the use of portapak cameras with random sync.

v) Two Points About These Tapes

There are two important points to underline about the four tapes described above.

First, there is the fact that these tapes were not originally designed and produced with the idea of using viewing guides with them. Rather they are examples of available locally produced instructional video tapes presently in use in some of the English Cegeps. The viewing guides were written up and used as a "post-hoc design" so to speak.

Each of the tapes used in this study was divided in a post-hoc fashion into three or four segments with each segment corresponding to a section in the viewing guide. The length of each segment varied from 6 to 10 minutes, depending on the inherent topical divisions

within each tape. It was felt that there would be the least amount of conflict if the tape was stopped at a terminating point in the development of a certain topic within the tape than if it were stopped artificially in the middle of a topic. The inherent division of content within the tape rather than equal time segments was the main factor in deciding where to chop up each tape. For example, the Newton tape is divided into four sections, with three sections corresponding to each of Newton's three laws and a fourth section dealing with the units of mass, force and acceleration. With this type of division, certain sections end up being longer than others. This brings certain benefits to the student since not only does the guide follow the inherent divisions of the tape but in addition there is variety in pace as well.

The second point to be made is that the program content of these tapes represents the common "task" (Tuckman, 1972, p.298) which both treatment groups were exposed to. In each of the four experimental situations in this study, both treatment groups each viewed an identical video tape on identical equipment in nearly-identical conditions. Further, both treatment groups in each situation each wrote an identical paper-and-pencil test on the content of the tape in question.

B. The Learning Packages

The "learning package" which forms part of the Package treatment consisted of a list of general instructions, a list of behavioral objectives and a viewing guide.

The general instructions simply indicated what the student would be doing during the treatment session, namely, viewing the tape with a viewing guide, writing a paper-and-pencil test and filling a questionnaire.

The behavioral objectives consisted of a one-page list telling the student what he should be able to do after viewing the tape. Sample instruction sheets and behavioral objectives lists can be found in Appendix I.

The viewing guide consisted of a number of sections corresponding to the sections in the video tape. In each section there were two parts - Part A and Part B. Part A consisted of multiple choice and fill-in-the-blanks questions which the student was asked to complete while viewing the tape. At the end of each section of the tape, the tape was stopped and the student was then asked to complete Part B which consisted of a review of that section. An answer sheet for the review was provided so that the student could get immediate feedback on his performance. The tape was then started again for the next section with the student following the same procedure. A sample of the Newborn guide as well as sample sections from some of the other viewing guides used in this study appear in Appendix II.

4. The Measuring Devices

A. The Paper-and-Pencil Tests

A separate paper-and-pencil test was constructed for each individual video tape. Each test consisted of a combination of multiple-choice questions, fill-in-the-blanks, and open-ended production-type questions. The content validity of each test was checked out with the corresponding teachers in each subject area. In each case, they found the tests (with some minor revisions in terminology) to be adequate measures of the content of the tape. Each test was also tried out on a few students prior to each experiment in order to determine the approximate time heeded for completing the test.

The Newborn test was 6 pages long and consisted of 65 short answer items covering more or less equally each section of the tape. Each item was worth one point, providing a score range from 0 to 65. Students took about 25 minutes to complete the test.

The Traction test was 5 pages long and consisted of 39 short items with emphasis on changing the traction apparatus and objectives of good nursing care. Most items were worth one point with some worth two points, providing a total score range from 0 to 47. Students took about 30 minutes to complete the test.

The Work test was 6 pages long with 21 short-answer items and three problems. The short-answer items measured recall of basic concepts and principles while the problems measured the ability to use recalled formulas to solve simple situations involving the concepts of work, energy and power. The total score was 0 to 34 with 9 points for the problem section and the remainder for the short answer section. Students took about 25 minutes to complete the test.

The Newton test was 6 pages long and consisted of 31 short-answer items and 2 problems for a total score range of 0 to 47. The scoring was equally weighted across Newton's three laws. Students took about 30 minutes to complete this test.

A sample of the Traction test as well as sample pages from the other three tests can be found in Appendix III.

Time and other factors did not permit the use of pilot groups to check out the reliability of each test prior to the experiment. Consequently, a post-hoc item analysis was conducted (Veldman, 1967) on each test in order to determine each test's internal consistency i.e., determine the extent to which the items in the test were measuring the same thing. The overall reliability for each test was quite high, ranging from r_{xx} = .8365 for the Work tape to r_{xx} = .9485 for the Newborn tape, with r_{xx} = .9179 for the Newton tape and r_{xx} = .9472 for the Traction tape.

For each test, the correlation of each test item with total test score was found in order to eliminate those items with a low discrimination. Except for the Work test, all items-to-total score correlations with $r < .5$ were eliminated from the total number of items on each test. For the Work test, correlations with $r < .2$ were eliminated. The results of this elimination process increased the overall reliability of each test as Table 2 on the following page shows.

TABLE 2. Internal Consistency of Each Test

Tape	No. of Items (before elimination)	r_{xx} (before elimination)	No. of Items (after elimination)	r_{xx} (revised)	Range of Difficulty Index
Newborn	65	.9485	35	.9569	.34 - .95
Traction	39	.9472	27	.9547	.50 - .85
Work	30	.8365	24	.8719	.25 - .97
Newton	33	.9179	23	.9242	.28 - .75

B. The Questionnaire

The purpose of the questionnaire was to determine the attitude of students to the Package approach to viewing tapes i.e. get personal feedback from the students as to what they thought about using objectives and viewing guides with video tapes.

The questionnaire was three pages long and consisted of 3 parts. In the first part, a Likert scaled response format ranging from "strongly agree" to "strongly disagree" was used to measure student attitudes to 9 different statements about the video tape they had just seen. In the second part they were asked to indicate which part of the video package they liked, which parts they disliked and whether or not they would like to see more presentations of this type where video tapes are viewed with viewing guides. The third part was left open-ended for any further comments. A sample of the questionnaire appears in Appendix IV.

5. The Research Design

Since complete randomization of subjects was not possible, intact classes had to be used. Consequently, a quasi-experimental rather than a true experimental design was used. (Campbell and Stanley, 1963). The design for each of the four experimental situations was diagrammed as follows:

Intact Group Posttest-Only Control Group Design

$$\begin{array}{cccc} T_1 & - & X_1\ Y_1 & O_1 \\ \hline T_2 & - & X_2\ Y_1 & O_2 \\ \hline C & - & - & O_3 \end{array}$$

This design is similar to the true posttest-only control group design except that the subjects, rather than being completely randomized, are taken from intact classes. (Hence the reason for the dotted lines).

In this design, the first treatment group (T_1) was exposed to the Package approach (X_1) for a particular video tape (Y_1) and given a posttest (O_1) immediately after the treatment. A second treatment group (T_2) was exposed to the Tape-only approach (X_2) for the same video tape (Y_1) and given the same posttest (O_2) immediately after the treatment. Finally a control group (C) simply took the same posttest (O_3) without any treatment.

This design controls most threats to internal validity: Both treatment groups in each situation view the tape in identical or nearly identical classrooms and at identical times or, at the most, one day apart. This means that threats to validity due to history, maturation and experimental mortality are quite well controlled. No pretest is used so that sensitization due to testing does not pose a problem. The reliability and validity of each test used in each of the four situations is checked out so that any threat due to poor instrumentation is also controlled. Finally, the use of two tapes in two subject areas allows a control over the stability of the experiment.

The impossibility of complete random assignment of subjects does, however, pose a problem in terms of selection bias. To counteract this, the experimenter investigated the possible factors which would indicate the extent to which both treatment groups were identical in composition. As reported above, the mean age across both groups for each tape was approximately the same. Further, except for the Newton tape, the mean mid-term test scores was also approximately the same across both treatment groups for each situation. These two factors, age and average classroom test performance, would seem to indicate a certain homogeneity across both groups for each tape.

Lastly, it should be kept in mind, as reported above, that subjects for the Traction tape were randomly assigned to the treatment groups; for this tape at least, selection bias was definitely controlled.

6. The Variables

Briefly, the variables were identified as follows:

A. Independent variable: The Package versus the Tape-only approach to viewing video tapes versus the control groups.

B. Moderator variable: subject matter - Physics and Nursing.

In order to determine the extent to which the findings would be generalizable to more than one subject, video tapes from Physics and Nursing were used. Subject matter was then chosen as a moderator variable to determine the extent to which this factor might interact with the treatment to affect performance.

C. Learning dependent variable: student scores on the custom-made revised short-term recall tests.

D. Attitude dependent variable: degree of positiveness of student responses to the custom-made questionnaire.

7. The Procedure

The operational procedure for the Package group of each experiment was roughly as follows:

i) the video tape recorder and monitor were set up and the tape threaded and ready to go before the students entered the classroom.

ii) once all students were in the classroom, the learning packages were distributed.

iii) The experimenter than read out loud the general instructions found on the first page of the learning package.

iv) students were then given a few minutes to read over the list of objectives in their learning package.

v) the experimenter than called for attention and took a few minutes to explain how they were to use the viewing guide.
(Steps i-v took about 15 min.)

vi) the tape was then started and later periodically stopped after each section to allow students to complete the review parts of their guides.
(30 to 45 min. depending on the length of the tape)

vii) at the end of the tape, students were given a few minutes to look over the complete viewing guide.

viii) the viewing guides were then picked up and the test distributed.
(30-35 min.)

ix) after completing the test, students filled out the questionnaire.
(5 min.)

x) on the average, the total time of the first treatment session was approximately 1½ hours.

The operational procedure for the Tape-only group went as follows:

i) the video tape recorder and monitor were set up and the tape threaded as in the first treatment session.

ii) once all the students were in the classroom, the experimenter explained that they would be viewing a video tape on the particular subject in question, indicating also the length of the tape. He further explained that they would be given a short answer test immediately after the viewing and that they would have to complete this test without the aid of notes.

iii) the tape was then started and played through without any stops.

iv) at the end of the tape, the test was distributed.

v) at the end of the allotted time, the tests were picked up and the class dismissed.

vi) in this second treatment group, the average total time was about 15 minutes less than the first treatment session.

The operational procedure for the pure control group was quite simple. Students were asked to complete the test as a means of giving us an indication of the average student's general knowledge about the subject matter in question. Again the test was administered without the aid of notes and picked up at the end of the allotted time.

Table 3 on page 34 summerizes the details of date, place and time for each of the four experiments in this study.

TABLE 3. Operational Details of Each Experiment

TAPE	GROUP	DATE	TIME	PLACE
NEWBORN	PACKAGE	SEPT. 25,'74	2 PM - 3:45PM	ROYAL VICTORIA NURSE'S RESIDENCE CLASSROOM I
	TAPE-ONLY	SEPT.26,'74	2 PM - 3:30PM	"
	CONTROL	OCT. 1, '74	11AM - 11:30AM	DAWSON COLLEGE SELBY CAMPUS CLASSROOM
TRACTION	PACKAGE	NOV.12,'74	1:00-2:30	DAWSON, SELBY CLASSROOM
	TAPE-ONLY	NOV.12,'74	1:00-2:30	DAWSON, SELBY CLASSROOM
	CONTROL	NOV.19,'74	1:00-1:30	DAWSON, SELBY CLASSROOM
WORK	PACKAGE	NOV.14,'74	10:30-12:00	VANIER, STE CROIX CLASSROOM
	TAPE-ONLY	NOV.15,'74	3:00-4:30	VANIER, STE CROIX CLASSROOM
	CONTROL	NOV.1,'74	11:00-11:30	VANIER, STE CROIX CLASSROOM
NEWTON	PACKAGE	OCT.11,'74	1:00-2:30	DAWSON, SELBY CLASSROOM
	TAPE-ONLY	OCT.11,'74	1:00-2:30	DAWSON, SELBY CLASSROOM
	CONTROL	NOV.20,'74	1:00-1:30	DAWSON, RICHELIEU CLASSROOM

As we can see from this table, both treatment groups for each experiment viewed the tape either simultaneously, in the case of the Traction and Newton tapes, or sequentially, with only one day apart, in the case of the Newborn and Work tapes. Further, environmental conditions were nearly identical for the two treatment groups in each experiment. Lastly, identical ½" Panasonic video tape players and 23" Electrohome monitors were used for both treatment groups in each experiment. All these are factors in the procedure which helped to control against threats to internal validity due to history, maturation and the like.

8. Data Analysis

Once the data from the tests were scored and coded, a three-way analysis of variance following the Balanova program for the CDC computer was used in order to determine the statistical significance between the means across the different groups, at the preset alpha level of $p = .01$. The analysis of variance determines the effect of each factor on the dependent variable as well as any significant interaction between factors. The three factors were: subject matter (A), individual tapes (B), and treatment (C), with individual tapes (B) nested within subject matter (A). (Winer, 1962, p.364). Table 4 on the following page illustrates the 2X2X3 statistical design used.

Following this analysis of variance, the Scheffé multiple comparison test was used to determine which pairs of means were significantly different at the $p < .01$ level. (Ferguson, 1966, pp.296-297). The results of both the analysis of variance and the Scheffé test are found in the next chapter.

TABLE 4. Three-Way Analysis of Variance With a Nested Factor

(The numbers in each cell represent the total number of subjects)

	C_1 (Package Treatment)	C_2 (Tape-only Treatment)	C_3 (Control)	
B_1 (Newborn)	14	14	13	NURSING A_1
B_2 (Traction)	11	11	6	

	C_1	C_2	C_3	
B_1 (Work)	19	19	9	PHYSICS A_2
B_2 (Newton)	23	23	10	

CHAPTER 4

THE RESULTS

1. FIRST HYPOTHESIS - THE EFFECTS OF OBJECTIVES & GUIDES

The means of the Package groups, as indicated in Table 5 on the following page, were consistently greater than the means of the Tape-only groups across the four experimental situations. Further the means of both treatment groups were greater than those of the control groups.

The analysis of variance (Table 6, p.39) showed a significant difference in means for the treatment factor ($F = 164.10$; $p < .01$). The Scheffé multiple comparison test (Table 7, p.40) on the different pairs of means for the treatment factor indicated a significant difference ($p < .01$) between the two treatment groups in favor of the Package treatment, as well as between each treatment group and the control group.

These results justify the adoption of the first hypothesis, namely, students who viewed video tapes with the aid of behavioral objectives and viewing guides performed significantly better on the recall test than students who viewed the same video tapes without these aids.

2. SECOND & THIRD HYPOTHESES: SUBJECT MATTER EFFECTS AND THE EFFECTS OF INDIVIDUAL VIDEO TAPES

The analysis of variance (Table 6, p. 39) showed a significant difference in means for both the subject matter factor ($F = 78.59$; $p < .01$) and individual video tapes ($F = 41.95$; $p < .01$). Nursing subjects performed better than Physics subjects. Within Nursing, the Newborn groups performed better than the Traction groups while within Physics, the Work groups performed better than the Newton groups.

TABLE 5. MEANS FOR EACH OF THE 12 COMBINATIONS IN THIS STUDY

	C_1 PACKAGE	C_2 TAPE-ONLY	C_3 CONTROL	
B_1 (NEWBORN) $\bar{X}$ = 23.1630	32.2857	26.3571	10.8462	A_1 (NURSING) $\bar{X}$ = 19.5790
B_2 (TRACTION) $\bar{X}$ = 15.9949	24.0909	19.7273	4.1666	

	C_1	C_2	C_3	
B_1 (WORK) $\bar{X}$ = 16.2086	20.5789	18.1579	9.8888	A_2 (PHYSICS) $\bar{X}$ = 12.9434
B_2 (NEWTON) $\bar{X}$ = 9.6782	13.6522	12.7826	2.6000	
	$\bar{X}$ = 22.6519	$\bar{X}$ = 19.2562	$\bar{X}$ = 6.8754	

TABLE 6. ANALYSIS OF VARIANCE OF PERFORMANCE ON POSTTEST SCORES

SOURCES	M.S.	D.F.	F - RATIO
A (SUBJECT MATTER)	1631.44	1	78.5938*
B (TAPES)	870.97	2	41.9586*
C (TREATMENT)	3406.46	2	164.104 *
A X C	305.31	2	14.7085*
B X C	22.53		.2714
WITHIN	20.757		

* $p < .01$

TABLE 7. SCHEFFÉ TEST CONDUCTED ON THE MEANS FOR THE TREATMENT FACTOR

MEANS IN RANK ORDER

I 22.6519 II 19.2562 III 6.8754

COMAPARISONS	F
I, II (Package; Tape-Only)	18.60*
I, III (Package; Control)	290.76*
II, III (Tape-Only; Control)	179.07*

* $p < .01$ $df_1 = 2$ $F_1 = 9.50$
$df_2 = 169$

These results justify the rejection of the second and third hypotheses. Subject matter does have a significant effect on performance and there are effects due to the video tapes themselves.

3. FOURTH HYPOTHESIS - THE INTERACTION BETWEEN SUBJECT MATTER & TREATMENT

The analysis of variance (Table 6, p. 39) indicated a significant interaction between subject matter and treatment ($F = 14.70$; $p < .01$). The Scheffé test (Table 8, p 42) on the pairs of means for the interaction between subject matter and treatment indicated a significant difference ($p < .01$) across all pairs except for two cases. There were no significant differences between the Nursing and Physics control groups. We can assume then that the composition of each of the control groups across the four experiments was quite similar. Further, there were no significant differences between the two treatment groups in the Physics area. This would seem to indicate that although on the average the Package treatment was significant across both subject areas, it was not significant in Physics. We can assume that the results were so highly significant in the Nursing tapes that they tended to carry the less highly significant Physics tapes along with them - with the end result that on the average a significant difference is indicated across both subject areas.

In order to determine which particular combination of subject matter and treatment (or A X C) had a significant effect on performance, the A X C means were plotted on a graph as seen in Fig. 1 on page 43 . We can see from this graph that there is a greater variation in A_1 than in A_2. This would seem to indicate that the interaction of A_1 X C_1 had a significant effect on performance. In other words, Nursing students who viewed the video tapes with a viewing guide performed significantly better than students in other combinations.

TABLE 8. SCHEFFÉ TEST ON MEANS FOR INTERACTION BETWEEN SUBJECT MATTER & TREATMENT

MEANS IN RANK ORDER

I	A_1 C_1	28.1883	(NURSING - PACKAGE)
II	A_1 C_2	23.0422	(NURSING - TAPE-ONLY)
III	A_2 C_1	17.1156	(PHYSICS - PACKAGE)
IV	A_2 C_2	15.4703	(PHYSICS - TAPE-ONLY)
V	A_1 C_3	7.5064	(NURSING - CONTROL)
VI	A_2 C_3	6.2444	(PHYSICS - CONTROL)

COMPARISONS	F
I, II	15.94*
I, III	92.56*
I, IV	121.68*
I, V	222.45*
I, VI	250.43*
II, III	26.51*
II, IV	43.28*
II, V	125.52*
II, VI	146.74*
III, IV	2.73
III, V	58.19*
III, VI	74.48*
IV, V	39.97*
IV, VI	53.64*
V, VI	.72

* $p < .01$ $df_1 = 5$ $F_1 = 15.70$

$df_2 = 166$

FIG. 1a) INTERACTION OF SUBJECT MATTER & TREATMENT

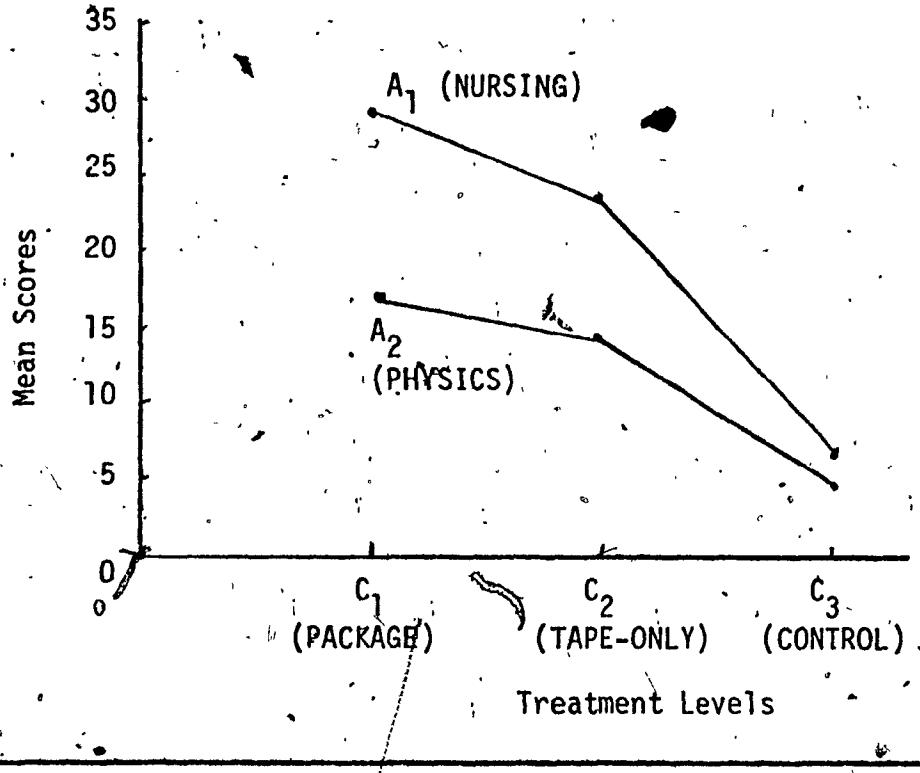
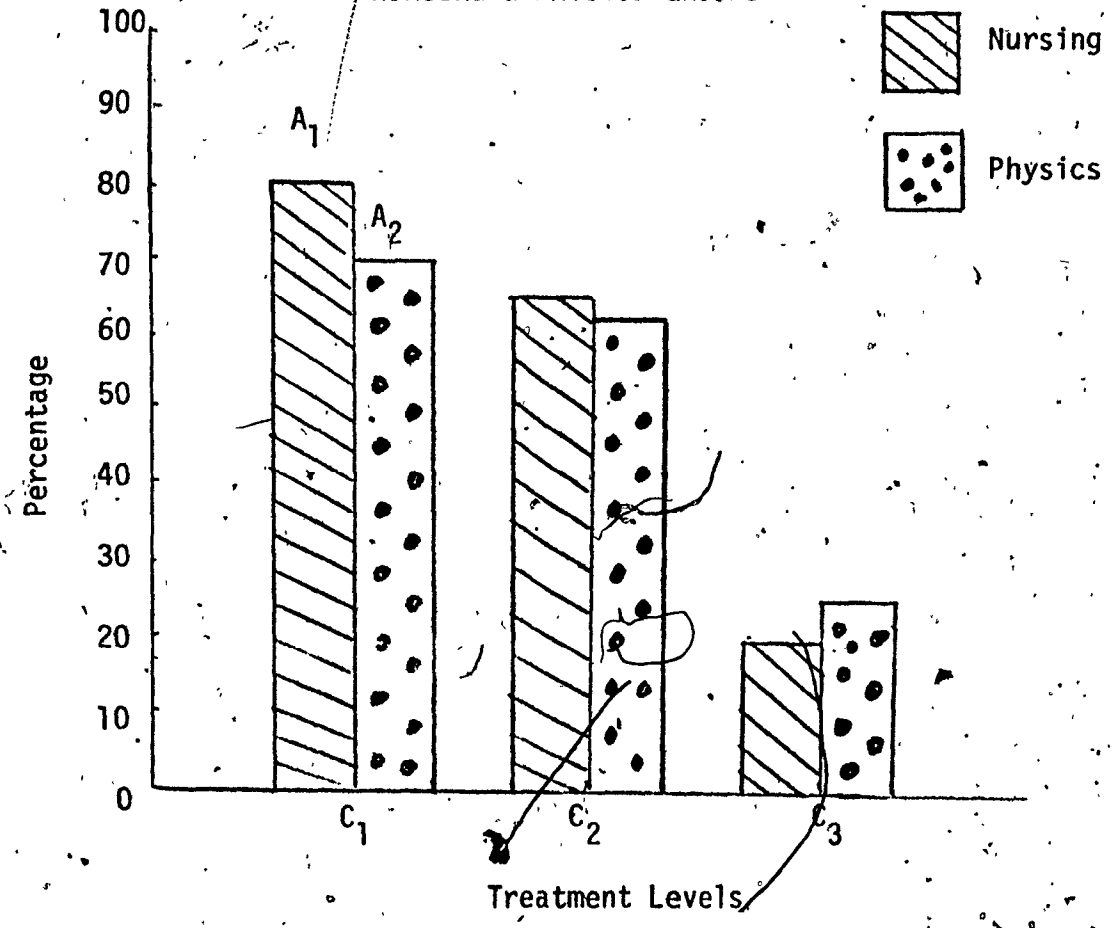


FIG. 1b) PERCENTAGE OF CORRECT SCORES FOR NURSING & PHYSICS GROUPS



These results justify only a partial adoption of the fourth hypothesis. Subject matter does not generally interact with treatment to affect performance since the results were consistently in the same direction across both Nursing and Physics tapes; however, there was a highly significant difference in Nursing but no significant difference in Physics.

4. FIFTH HYPOTHESIS - STUDENT ATTITUDE TO THE PACKAGE APPROACH

The results of the questionnaire across the four Package groups indicate on the whole a preference for viewing tapes with complementary aids such as viewing guides, as opposed to viewing tapes by themselves. The means and ranges for each of the Package groups as seen in Table 9 on page 45 indicate that the Newborn, the Traction and the Work Package groups were in general agreement with this type of presentation while the Newton Package group was undecided. Table 10 on page 46 summarizes the mean results on each question for each of the four groups. This table shows a generally positive attitude to most aspects of the Package approach with some neutral responses to other aspects. Further, Table 11 on page 47 shows that a fairly high percentage of students indicated they would like to see more presentations of this type where video tapes are viewed with objectives and guides.

The students who objected to the use of a viewing guide did so on the grounds that filling out a viewing guide tended to interfere with actually viewing the tape. This objection was also raised even by those who were generally favorable to the idea of a learning package. They felt that the review sections of the viewing guide were extremely helpful, but that the fill-in sections, which were done while viewing the tape, definitely tended to interfere with viewing. Further, a few students who were unfavorable to the learning package felt that the guides directed their attention only to certain parts of the tape, while they would have been interested in concentrating on the other parts.

The general conclusion from reading these questionnaires is that the use of viewing guides was seen to be helpful and advantageous

TABLE 9. MEANS FOR EACH OF THE PACKAGE GROUPS ON THE QUESTIONNAIRE

(CODE: 5 = strongly agree; 4 = agree; 3 = undecided; 2 = disagree; 1 = strongly disagree)

TAPE	MEAN	RANGE
NEWBORN	4.1	3.5 - 4.6
TRACTION	3.9	2.4 - 4.4
WORK	4.1	3.2 - 5
NEWTON	3.4	2.2 - 4.4

TABLE 10. MEAN RESULTS OF EACH STATEMENT OF THE QUESTIONNAIRE

CODE: For positively stated statements, numbers 1,2,3,4,7,9
5 - strongly agree; 4 - agree; 3 - undecided; 2 - disagree; 1 - strongly disagree

For negatively stated statements, numbers 5,6,8
1 - strongly agree; 2 - agree; 3 - undecided; 4 - disagree; 5 - strongly disagree

	STATEMENT	TAPE	MEAN	RANGE
1.	The video tape was a good means of presenting the subject.	NEWBORN	4.2	4 - 5
		TRACTION	4.0	3 - 5
		WORK	4.3	2 - 5
		NEWTON	4.0	2 - 5
2.	The objectives were helpful in letting you know what to remember.	NEWBORN	3.8	2 - 5
		TRACTION	3.7	2 - 5
		WORK	4.0	2 - 5
		NEWTON	4.0	2 - 5
3.	The guide allowed you to learn the content better.	NEWBORN	4.2	4 - 5
		TRACTION	3.9	2 - 5
		WORK	4.5	4 - 5
		NEWTON	3.3	2 - 5
4.	Using objectives & guides with videotapes is a better way to learn than using tape alone.	NEWBORN	4.3	4 - 5
		TRACTION	4.0	2 - 5
		WORK	4.4	4 - 5
		NEWTON	3.3	2 - 5
5.	The guide tended to interfere with viewing the tape.	NEWBORN	3.3	2 - 5
		TRACTION	2.0	1 - 5
		WORK	3.8	2 - 5
		NEWTON	2.4	1 - 4
6.	You could have learned as much from this tape without a guide.	NEWBORN	3.8	3 - 5
		TRACTION	3.0	2 - 4
		WORK	4.0	3 - 5
		NEWTON	3.4	3 - 5
7.	The amount of information in the tape was just the right length.	NEWBORN	3.9	3 - 5
		TRACTION	3.6	2 - 4
		WORK	3.5	2 - 5
		NEWTON	3.2	3 - 5
8.	The review part of each section could have been eliminated.	NEWBORN	4.0	3 - 5
		TRACTION	4.0	3 - 5
		WORK	4.2	3 - 5
		NEWTON	4.0	3 - 5
9.	The stops after each section were beneficial.	NEWBORN	4.2	4 - 5
		TRACTION	4.2	4 - 5
		WORK	4.1	4 - 5
		NEWTON	4.3	3 - 5

TABLE 11. Summary of the Responses to the Question: "Would you like to see more presentations of this kind where tapes are viewed with objectives and guides?"

TAPE	FAVORABLE RESPONSE	UNFAVORABLE RESPONSE	UNDECIDED
NEWBORN	82%	13%	5%
TRACTION	81%	19%	--
WORK	94%	6%	--
NEWTON	50%	35%	15%

to learning the content of the video tape. However, there was a strong feeling that the guide should be designed such that it does not interfere with actually viewing the tape. This indicates to the experimenter that future viewing guides would consist of review sections only to be filled out while the tape is stopped. Filling out a guide while viewing interferes with actual viewing and probably interferes with learning from the tape.

To conclude, the results of the questionnaire justify the adoption of the fifth hypothesis. Students were not repelled by the Package approach to viewing tapes. On the contrary, student attitude tended to be quite positive.

5. SUMMARY

In summary, the results of the study in relation to the five hypotheses in question can be stated as follows:

i) Students in the Package groups performed significantly better ($p < .01$) on the paper-and-pencil tests than students in the Tape-only groups; further, the Package groups and Tape-only groups both performed significantly better ($p < .01$) than the control groups.

ii) Subject matter did have a significant effect on performance ($p < .01$). Although the results were consistently in the same direction in favor of the Package groups across the four experimental situations, there was a significant difference at the .01 level in Nursing, but no significant difference in Physics between the Package groups and the Tape-only groups.

iii) Individual video tapes did have a significant effect ($p < .01$) on performance.

iv) There was a significant interaction ($p < .01$) between subject matter and treatment which indicated that Nursing subjects in the Package groups performed significantly better than subjects in other combinations.

v) The questionnaire indicated that students were not repelled by the Package approach to viewing video tapes; on the cont[illegible], the majority of subjects indicated a preference for viewing video tapes with complementary aids as opposed to viewing tapes by themselves.

CHAPTER 5

DISCUSSION

1. Conclusions

The findings in this study lead to the following conclusions:

i) Students who view instructional video tapes with the aid of behavioral objectives and viewing guides tend to retain more of the content of the tapes than students who view the same tapes without these aids.

ii) Viewing guides should be designed such that they do not interfere with actually viewing the tape. Students should not be asked to do other things while the tape is running. Rather the tape should be stopped at strategic points where the student can be asked questions about the material he has just seen.

iii) Behavioral objectives and viewing guides seem to be part of the optimum viewing conditions necessary for effective learning from instructional video tapes.

iv) Instructional video tapes are not meant to stand by themselves but rather should be designed with introductory material and adjunct activities, of which behavioral objectives and viewing guides are but two possibilities. Perhaps introductory material and adjunct activities should also be part of the design of instructional media packages other than video tapes - film, slide/tape, etc.

v) This study confirms Lavin's findings (1971) about the use of adjunct activities with audio-visual material, but does so at much more confident level - $p < .01$ compared to $p < .14$ and $p < .05$ for Lavin. Further the findings

are generalizable to a more heterogeneous population than that of Lavin's study - both males and females from two different subject areas, as opposed to females from only one area. Lastly, Lavin's findings about the use of adjunct activities with films can be expanded, with this study's results, to include video tapes.

2. The Lack of Significant Difference In Physics: Interpretation

Although the results in this study were consistently in the same direction in favor of the Package approach to learning from video tapes, the statistical analysis did not reveal any significant difference in the Physics area. This lack of significant difference in Physics is attributable to a number of factors.

First, there is the seeming lack of homogeneity across both treatment groups in the experiment with the Newton tape. As reported above in the section on subjects, the average classroom test performance of the Package group seemed to be significantly lower than that of the Tape-only group. Because of this, one would have expected the Tape-only group to do better than the Package group on the recall test in the experiment. On the contrary, the Package group performed better than the Tape-only group, though not significantly better. It is interesting, however, that the first treatment group did better than the second group on the video tape test, despite the fact that the first group seemed on the average to be intellectually inferior. This would seem to indicate that viewing a video tape with a guide will lead an intellectually inferior group to perform better than an intellectually superior group that watches the tape without a guide. Again, this is the only sample out of the four samples in this study where the mean of the Package group was only slightly greater than the mean of the Tape-only group - as opposed to the other samples where the mean of the Package group was substantially and significantly greater than that of the Tape-only group.

Secondly, there is the fact that the treatment groups in this experiment each had different teachers. Their approach to the subject might have been so different that the results in the experiment might be due to different teacher effects on the students.

Thirdly, the novelty effect of completing a guide while watching a video tape might have interferred with learning in the Newton Package group. Of all four Package groups in this study, this was the only group that seemed confused about what they had to do. The experimenter had to take more time to explain the procedures; students seemed to be slower at completing the review sections. The general attitude of this group is reflected in the questionnaire where many expressed the feeling that the session was asking them to do too much in too little time. Only 50% of the group felt generally favorable to the idea of using guides with video tapes, compared to the other three Package groups where over 80% of the subjects expressed that they liked the idea of using guides with tapes. There seems to be an interesting correlation here between student attitude to the Package treatment and performance on the recall test. It is interesting that the group which performed in a least highly significant way (the Newton Package group) is also the group that did not seem as enthusiastic as the others about using guides with video tapes.

The experimenter has dealt at length with attempting to explain this lack of significant difference in Physics because he feels strongly that subject matter did not really affect performance, a fact that is attested to by many previous studies (Duchastel & Merrill, 1973). The lack of significant performance in Physics should not lead us to conclude prematurely that viewing guides should only be used with Nursing tapes but not with Physics tapes.

3. The Importance of Interaction In Learning

The findings in this study parallel those of Rothkopf (1970) in his study of the effect of different reading techniques on learning. Both studies point to the importance of active participation on the

part of the learner when presented with material to be learned, whether this material be prose passages or video tapes. Some kind of directive structure leading the student to interact in a meaningful way with the material seems to be essential for effectively learning that material. Rothkopf (1966) used "inserted questions" within prose passages as a way to get the student to interact with the passage. This study used "viewing guides" along with video tapes as a way to get the student to interact with the tape. It is interesting that both studies led to similar results, namely, the superiority of interactive structured approaches to unstructured approaches for effective learning.

These and other similar studies (Lavin, 1971) would seem to justify generalizing to media other than prose passages and video tapes the principle that some kind of adjunct activity be an integral part of the design and use of any instructional media package. This adjunct activity, which can take many forms, constitutes what Rothkopf calls "mathemagenic behavior" i.e. behavior which "gives birth" to learning. The learning theory underlined here is that student behavior during the learning process will determine what is learned. When that behavior is relatively passive, learning will probably not be as high as when that behavior is relatively active and interacting in a meaningful way with presented material.

4. Recommendations for Future Research

In specific terms, future research in this area can follow up a number of possibilities. First, there is the need for a research design that would attempt to measure the effects of objectives only versus viewing guides only. The design in this study dealt with the cumulative effect of using objectives and guides together; it did not deal adequately with the effects of behavioral objectives alone.

Secondly, there is a need to measure the effects of using adjunct materials on long-term recall. This study concerned itself only with immediate short-term recall. It would be interesting to compare the results of this study with those of a future study that would administer the posttest a week or two after the treatment.

Thirdly, there is a need to develop measuring devices other than paper-and-pencil test, where this kind of test is not the most valid. This is especially important in the area of "training" tapes, where different types of measures of operational performance need to be constructed, such as checklists and error-count tests.

Fourthly, there would be the need to conduct an extended long-term study. The research here would involve using a complete series of video tapes over a whole term with two different groups each exposed to the two different treatments of either using guides with tapes or simply viewing the tapes without any adjunct material.

Last but not least would be the need to try out the viewing guide treatment in subject areas other than science. Lavin (1971) used it in chemistry. This study has expanded it to physics and nursing. It would be interesting for future studies to apply this treatment in the arts and social science sectors in order to ultimately determine the generalizability of this type of learning from instructional video tapes.

In more general terms, from the point of view of research design, there is a need at the moment within educational research to construct what Snow (1974) calls "representative and quasi-representative" designs in order to do realistic research on teaching. A representative design is one where research is carried out in a real environment truly representative of reality as opposed to an artificial design where research is carried out in unnatural conditions. The importance of "representative" research lies in the fact that human behavior is complex and multi-dimensional. Research than on any aspect of human behavior such as learning should be conducted in an environment as multi-dimensional as is possible rather than in simplistic one-dimensional situations. Indeed the tendency in some research designs to strip "the environment down to a minimum in order to control and determine the role of a very few variables, may be a potentially self-defeating process " (Pereboom, 1971, p.439)

Since a completely representative design is never possible in reality, Snow (1974) recommends a "quasi-representative" design where even though not all threats to population validity are ruled out, most threats likely to limit generalization are checked.

Snow outlines the characteristics of a quasi-representative design. First, research is moved from the laboratory to the schools where at least the normal flow of everyday events is represented. Secondly, systematic replications are conducted whereby the experimenter varies teachers, material to be learnt, context, etc. in order to increase the ecological validity of his study. Third, intraexperiment observations are conducted in order to find out what subjects were actually doing during the experiment, how they saw the treatment and how it affected them. Fourthly, as a complement to the above, extraexperiment observations are recorded such as whether or not the material to be learned in the experiment is continuous with the subject matter of the course or the extent to which the experimental conditions are disruptive. Fifthly, there is the need to give students adequate preparation prior to the experiment in order to ward off novelty effects and tune the subjects so that the experiment becomes a smooth part of the daily flow of events. The easier the flow, the more representative will be the research. Last, but not least, is the need for extended treatments. Most school learning situations are extensive in time so that "most generalizations about school learning need to be built on research using substantial samples of learning time " (Snow, 1974, p.281)

In retrospect, this particular study had some of these quasi-representative design characteristics but not others. The research was conducted in a normal school situation as part of the normal flow of events. The material to be learnt was continuous with the subject matter of the course and was fitted in at the correct time in each course. A certain amount of intraexperiment observation was conducted in the form of a questionnaire and a certain amount of replication was built in especially in the variety of material to be learned. However, this study did not give students adequate preparations prior to the experiment nor did it conduct the experiments over an extended length of time.

Our main recommendation here in general research design terms is that future educational media research be patterned after the quasi-representative design model for ultimate generalizability of its results.

APPENDIX I

Samples of instruction sheets
and behavioral objectives lists

NURSING CARE FOR PATIENTS IN TRACTION

GENERAL INSTRUCTIONS

1) You will be viewing a 25 minute VIDEO TAPE on "Nursing Care for Patients In Traction".

2) Before the viewing, you will be given a list of OBJECTIVES. These will tell you what you should be able to do after viewing the tape.

3) While viewing the tape, you will be filling out a VIEWING GUIDE. This guide will tell you what areas to concentrate on in the tape.

4) At the end of the tape, the viewing guide will be picked up and you will be given a short answer test on the content of the tape.

5) At the end of the test, you will be asked to fill out a short questionnaire where you can express what you think about this way of presenting information.

NURSING CARE FOR PATIENTS IN TRACTION

OBJECTIVES

After viewing this tape, you should be able, without the use of notes, to:

1) List the following orthopedic devices and describe their use:
   a) stainless steel plates - for compression of bone ends.
   b) stainless steel rods or "rush" nails - to reinforce the shaft of a bone.
   c) Smith-Peterson nail and McLaughlin plate combination - for hip fractures.
   d) ball and shaft device - for reconstructing the femoral head (top of the thigh bone) by replacing it.
   e) Smith-Peterson cup - for reconstructing the femoral head by reinforcing it; used for arthritis of the hip.

2) State two main reasons why traction is used in orthopedics.
   - to correct the alignment of bones.
   - to insure immobilization of the fracture.

3) Describe the two basic types of traction:
   i) SKIN TRACTION - for short-term immobilization.
   ii) SKELETAL TRACTION - for long-term immobilization of bones.

4) List the basic parts of the apparatus used in Skin Traction.

5) List in correct order the basic steps involved in changing the tape for a patient in skin traction.

6) List the parts of the apparatus for a patient in Skeletal Traction.

7) Describe what is meant by "balanced-suspension traction.

8) List the objectives of nursing care for a patient in traction and state which activities or procedures help to achieve these objectives.

APPENDIX II

Learning Package for the Newborn Tape
and Sample Sheets from the other Packages

NAME: _____

(Please Print)

LEARNING PACKAGE FOR THE VIDEO TAPE:

"EXAMINATION OF A NEWBORN BY A DOCTOR"

Prepared for use in the Obstetrics course of Dawson College's Nursing Department by Robert O'Meara and the Media Resources Centre with the help of the Obstetrics group - Isabel Hewitt, Peggy Mak, Shirley Davey, Emara Ochoa, Grace Miller

EXAMINATION OF A NEWBORN BY A DOCTOR

GENERAL INSTRUCTIONS

1) You will be viewing a 40 minute video tape dealing with the examination of a newborn baby by a doctor.

2) Before viewing, you will be given a list of objectives to look at. These will tell you what you should be able to do after viewing the tape.

3) You will also be given a viewing guide which you will be asked to fill out during the actual viewing of the tape. This guide will tell you what areas to concentrate on in the tape.

4) At the end of the viewing, you will be given a few minutes to look over this viewing guide.

5) The viewing guide will then be picked up and you will be given a written short answer test on the content of the tape. You will be asked to do this without the aid of notes.

6) Marks on this test will not count for a grade, but will help us determine a student's retention level when taught by video tape.

7) After the test, you will be asked to fill out a short questionnaire on this type of presentation.

EXAMINATION OF A NEWBORN BY A DOCTOR

OBJECTIVES

After viewing this tape, you should be able, without the use of notes, to:

1) List the five(5) key areas one looks at in general inspection of the newborn.

2) Distinguish normal from abnormal features in each of the five(5) areas.

3) Given a list of descriptive statements about each part of the newborn's body,
   i) state which are normal or abnormal features of each part.
   and/or ii) state which are true or false statements about the newborn.

4) Distinguish a mature from a premature baby under the following areas: nipple, sole creases, ear cartilege and genitals.

5) Measurement of the Baby
   a) Name the two(2) important areas the doctor measures on a newborn to determine normality.
   b) State what the relationship between these two(2) measurements should be for a normal newborn.
   c) State the normal range in cm for these two measurements.

6) Identify the correct position a newborn should be put in when laid in his crib and the reason for this position.

EXAMINATION OF A NEWBORN BY A DOCTOR

VIEWING GUIDE

The purpose of this handout is to guide you in viewing this video tape. It will tell you the important areas you should concentrate on. The guide is divided into five sections. Each section has two parts. In PART A, you will be asked to check off the correct statements while you are viewing the tape. At the end of PART A, the tape will be stopped and you will be given a few minutes to fill out the review part of that section. i.e. PART B.

Procedure:

The procedure for each section will be as follows:

1) Take a few minutes to read over PART A of the section.

2) Complete PART A while viewing the tape.

3) When the tape is stopped at the end of PART A, complete PART B or the review part of that section and check your answers.

4) Repeat the procedure for each of the other sections.

5) When the tape is completely finished, you will be given a few minutes to look over the complete guide before being tested.

Now we're ready to start. Turn to PART A of section I on the next page. Take a minute to read over pages 3-4.

SECTION I FIRST GENERAL INSPECTION OF THE NEWBORN: THE DOCTOR LOOKS AT COLOR, ACTIVITY PATTERN, CRYING PATTERN, REFLEX ACTIVITY, AND MUSCLE TONE.

PART A

Instructions: Fill out this part while viewing the tape.
Put a tick (✓) beside the correct word or phrase.

1) COLOUR

a) Normal is: yellow _____
or pink _____

b) Different shades of pink on 3 hour-old baby is: normal _____
or abnormal _____

2) ACTIVITY PATTERN

a) does not move arms and legs equally: normal _____
abnormal _____

b) when stimulated, normal baby will: react _____
not react _____

3) CRYING PATTERN

a) normal baby cries when pinched: for a long time _____
or for a short while _____

4) REFLEX ACTIVITY

a) when dropped, normal baby's arms and legs:
will extend rapidly and contract slowly _____
or will stay loose _____

b) normal reaction of arms and legs:
symetrical _____
not symetrical _____

c) when lifted a normal newborn:
has good grasp _____
does not have good grasp _____

d) at 6-7 weeks, baby:
still has grasp _____
loses grasp _____

5) MUSCLE TONE

a) when lifted by hands, baby's elbows should be:
bent _____
extended _____

b) when lifted by feet, baby's knees should be:
extended _____
bent _____

c) when hungry, baby's muscle tone will be:
higher _____
lower _____

N.B. You are now finished with PART A of this section. When the tape is stopped, turn to the next page and complete the Review of this section.

PART B REVIEW

Now take five minutes to fill out the review below; you may refer back to PART A if you need to.

The doctor looks for five things: c_____
a_____ pattern
c_____ pattern
r_____ activity
m_____ t_____

1) COLOUR
   a) is normally p_____.
   b) a 3-hour old will normally have different c_____ in different parts.

2) ACTIVITY PATTERN
   a) normal baby will move arms and legs eq_____.
   b) when stimulated, he will re_____.

3) CRYING PATTERN
   a) will cry when pinched but only for _____.

4) REFLEX ACTIVITY
   a) when dropped, normal baby's arms and legs will ex_____. rapidly and con_____.
   b) normal reaction is sym_____.
   c) newborn has a natural g_____ instinct. He no longer has this grasp at _____ weeks old.

5) MUSCLE TONE
   a) when lifted by hands, normal newborn's elbows will be b_____.
   b) when lifted by feet, normal newborn's k_____ will be bent.

N.B. You are now at the end of this Review. Go to the next page to check your answers.

END OF PART B OF SECTION I.

ANSWERS TO REVIEW OF SECTION I

Doctor looks for color
activity pattern
crying pattern
reflex activity
muscle tone

1. a) pink
   b) colors

2. a) equally
   b) react

3. a) a short while

4. a) extend; contract
   b) symmetrical
   c) grasp; 6-7 weeks old

5. a) bent
   b) knees

N.B. Turn to Section II on the next page. Take 2 minutes to read over PART A (pages 7-9) before the tape starts again.

SECTION II FEELING THE BABY & SPECIFIC INSPECTION OF EACH PART: SKIN, HEAD, FACE, NECK, SHOULDER, FINGERS, & TOES

PART A

Instructions: Fill out this part while viewing the tape. Put a tick(✓) beside the correct word or phrase.

After looking over the baby, the doctor then proceeds to feel the baby. This feeling or palpation is a very important second step in the examination of the newborn.

SKIN

a) normally is: velvety _____
dried out _____

b) normally: hangs loosely in folds _____
does not hang loosely _____

APGAR SCORE

a) this is a rating of the baby's condition:
immediately after birth _____
a few hours after birth _____

b) this score is rated: as a number from 1 - 10 _____
as a letter from A - E _____

HEAD

a) the diamond-shaped fontanel or soft spot is slightly tense when baby cries; this is:
normal _____
abnormal _____

b) an elevated fontanel might indicate: internal bleeding _____
excess water _____

c) a severely depressed fontanel might indicate: missing bone structure _____
dehydration _____

d) Cephalhematomas or blood blisters on the widest parts of the skull:
are due to internal bleeding _____
are due to friction between skull & pelvis during delivery _____

e) These blood blisters:
are dangerous & should be immediately treated _____
are normal & resolve by themselves _____

EARS

a) Cuts behind the ears are usually due to:
forceps blades _____
newborn's scratching _____

b) Position of the ears should be relatively:
not symetrical _____
symetrical _____

c) an external ear canal indicates:
abnormal ear _____
normal ear _____

EYES

a) pupil is normally:
black and round _____
white and oval _____

b) a white pupil indicates:
too much fluid _____
congenital cataract _____

c) eyes tend to wander and are not parallel:
normal _____
abnormal _____

d) eyes have no eye-lashes:
normal _____
abnormal _____

e) if birth injury keeps baby's eye open, it should be:
left open _____
closed artificially _____

f) if baby's eye is left open and not lubricated:
cornea may dry out _____
eye may never close again _____

NOSE

a) normally:
soft & pliable _____
hard & bony _____

b) white spots on the baby's nose in the first few weeks:
normal _____
abnormal _____

c) these spots are due to:
excessive feeding _____
secretions from sebaceous glands _____

d) these spots will:
get bigger and remain _____
get bigger, pop and not reform again _____

MOUTH

a) hard and soft palate should be:
continuous _____
separated _____

b) normally the uvala should be:
visible _____
invisible _____

c) Presence of a uvala indicates:
no cleft palate _____
presence of a cleft palate _____

NECK

a) turning head from side to side:
there should be no unusual tightness or pulling _____
there is normally pulling _____

b) normally: short _____
long _____

c) crease in the baby's neck:
should be left alone _____
should be cleaned regularly _____

SHOULDER

a) the weakest link in the shoulder bone is:
scapula _____
clavicles _____

b) the clavicles (or collar-bone) are located:
in the front _____
in the back _____

c) the clavicle:
is strong and is never damaged during delivery _____
is weak and can often be damaged in delivery _____

FINGERS & TOES

In checking these the doctor is concerned with
_____ color
_____ number of digits
_____ grip reflex
_____ infection under the finger nails.

N.B. You are now finished with PART A of this section. When the tape is stopped, turn to the next page and complete the Review of this section.

PART B REVIEW

Take five minutes to fill out the review below; you may refer back to PART A if you need to.

After inspection, the doctor is concerned with feeling the baby. This is called pal_____.

1) The rating of a baby's condition immediately after birth is called the A_____ score.

2) When checking the head, the doctor feels for the diamond-shaped soft spot called the f_____.

3) Cephalhematoma or blood blisters on the skull are due to friction between sk_____ and pel_____ during delivery.

4) A normal ear should have an ex_____ ear c_____.

5) A normal pupil is bl_____ and _____.

6) A white pupil indicates a possible cat_____.

7) White spots on the nose due to secretion of sebaceous glands get bigger, pop and dis_____ after a few weeks.

8) Hard and soft palates of the mouth are normally con_____.

9) Presence of an uvala indicates no cl_____ pal_____.

10) The neck is normally sh_____.
Its creases are checked for possible inf_____.

11) The weakest link in the shoulder bone is the cl_____.

12) Finger nails are checked for possible inf_____.

N.B. You are now at the end of this Review.
Go to the next page to check your answers.

END OF PART B OF SECTION II

ANSWERS TO REVIEW OF SECTION II

Feeling the baby is called palpation

1) APGAR
2) fontanel
3) skull, pelvis
4) external ear canal
5) black; round
6) cataract
7) disappear or discharge
8) continuous
9) cleft palate
10) short; infection
11) clavicle
12) infection

N.B. Turn to Section III on the next page. Take one minute to read over PART A (pages 12-13) before the tape starts again.

SECTION III DETERMINING THE MATURITY OF A BABY

PART A Fill out this part while viewing. Put a tick (✓) beside the correct word or phrase.

At this point in the tape, the doctor tells us what areas to look at to determine the maturity of a baby. There are four key areas: nipples
sole creases
ear cartilege
genitals

1) NIPPLES:

a) normally are:
slightly enlarged _____
rather flat _____

b) normal tissue thickness is:
4 - 5mm _____
1 - 2mm _____
8 - 9mm _____

c) under 2 mm of tissue thickness would indicate that baby is:
younger than 38 weeks gestation _____
older than 38 weeks gestation _____

2) SOLE CREASES:

a) presence of sole creases indicates:
premature baby _____
normal mature baby _____

b) premature baby has:
tight sole with few lines _____
loose sole with many lines _____

3) EAR CARTILEGE:

a) ear tends to remain in the position you put it in:
indicates baby is premature _____
indicates baby is mature _____

b) premature baby has:
little ear cartilege _____
much ear cartilege _____

4) GENITAL AREA:

a) baby girl's genital area is normally:
enlarged _____
flat _____

b) baby boy's testicles are normally:
large _____
small _____

c) if testicles are not descended, baby is often:
premature _____
mature _____

d) if one testicle is not descended,
it may have to be assisted down _____
it will come down by itself _____

e) a descended testicle is less prone to cancer than one left up:
true _____
false _____

NB. Your are now finished with PART A of this section. When the tape is stopped, turn to the next page and complete the Review of this section.

PART B REVIEW

Take five minutes to fill out the review below; you may refer to PART A if you need to.

In determining the gestational age or maturity of a baby, the doctor examines four areas:

n_____

s_____ c_____

e_____ c_____

g_____

1) Nipples should be enlarged and have at least _____ mm of tissue.

2) A tight sole with few creases indicates a pre_____ baby.

3) A mature baby's ear will tend to flap back when pulled forward because of the presence of ear car_____.

4) In a mature newborn boy, the testicles are normally des_____.

5) In a mature newborn girl, the genitals are enlarged and afford protection to the va_____.

N.B. You are now at the end of this Review.
Go to the next page to check your answers.

END OF PART B OF SECTION III

ANSWERS TO REVIEW OF SECTION III

To determine maturity, doctor examines:

nipples
sole creases
ear cartilege
genitals

1) 4 - 5mm
2) premature
3) cartilege
4) descended
5) vagina

N.B. Turn to Section IV on the next page. Take two minutes to read over PART A (pages 16-17) before the tape starts again.

SECTION IV CONTINUATION OF INSPECTION OF BODY PARTS: CHEST, ABDOMEN, CORD, HIP, BACKBONE, ANUS

PART A Fill out this part while viewing the tape. Put a tick (✓) beside the correct word or phrase.

CHEST

a) breathing in a normal newborn is:
from the chest _____
abdominal _____

b) a newborn exhibits increased movements of the chest during breathing:
normal _____
abnormal _____

c) crying in a newborn is:
beneficial since it expands lungs _____
harmful to the lungs _____

d) the bony lump in the middle of the chest is:
abnormal and indicates a cyst _____
the normal end of the sternum _____

ABDOMEN

a) excessively large indicates:
too much feeding _____
obstruction in the intestinal tract _____

b) excessively small indicates:
too little feeding _____
part of intestinal tract not in abdomen _____

c) normally: convex or slightly round _____
concave or depressed _____

d) the liver of a newborn is normally large:
true _____
false _____

CORD

a) the umbilical cord should be kept:
as dry as possible _____
as moist as possible _____

b) if the cord has only one artery, it is:
normal at this stage _____
a possible abnormality of circulatory system _____

c) if blood vessels are not eliminated when tie falls off:
it is dangerous and there could be bleeding _____
it is not dangerous and will resolve by itself _____

d) As the cord shrinks, the tie should:
tighten up _____
loosen up _____

HIP

a) the grip of the socket in the baby's hip is:
normally shallow & can easily be displaced _____
normally tight & is rarely displaced _____

b) in testing for possible hip displacement the doctor:
holds the baby by the feet _____
extends the hips at right angles _____

c) an arrested hip or the sound of a click from the hip as the doctor extends is:
normal _____
abnormal & must be treated _____

d) in treating a displaced hip, the doctor will:
extend the leg using splinters _____
keep the legs in a frog position _____

e) if a hip displacement is not treated early:
a permanent limp may result _____
it can easily be treated later on _____

f) hip displacement is more common in:
girls _____
boys _____

FEET

a) a deformation of the foot due to inter-uterine position is:
easily rectified if corrected early _____
never rectifiable _____

BACKBONE

a) the doctor inspects the lumbar and cervical region of the backbone for possible nervous system defects _____
to determine muscular co-ordination _____

b) an unusual tuft of hair in the lumbar region of the back indicates:
excessive male hormones _____
nervous system defects _____

ANUS

a) first bowel movements are charted to determine:
baby's propensity to toilet training _____
whether the digestive system is functional _____

b) a dimple at the apex of the anus is:
normal _____
abnormal _____

N.B. You are now finished with PART A of this section. When the tape is stopped, turn to the next page and complete the Review of this section.

PART B REVIEW

Take five minutes to fill out the review below; you may refer back to PART A if you need to.

1) Breathing in a newborn is abd_____ rather than from the chest.

2) Crying in a newborn is beneficial since it expands the l_____.

3) A newborn's abdomen is normally con_____.

4) In feeling the abdomen, the largest internal organ is usually the li_____.

5) The socket in a newborn's hip is normally sh_____ and can easily be dis_____.

6) To treat a displased hip, legs are kept in a f_____ position with diapers or some other means of imm_____.

7) Hip displacement is more common in g_____ than in b_____.

8) The doctor inspects the lum_____ and cer_____ regions of the backbone for possible nervous s_____ defects.

N.B. You are now at the end of this Review.
Go to the next page to check your answers.

END OF PART B OF SECTION IV

ANSWERS TO REVIEW OF SECTION IV

1) abdominal
2) lungs
3) convex
4) liver
5) shallow; displaced
6) frog; immobilisation
7) girls; boys
8) lumbar; cervical; system

N.B. Turn to Section V on the next page. Take a minute to read over PART A (pages 20-21) before the tapes start again.

SECTION V MEASUREMENT OF THE BABY
LISTENING TO INTERNAL ORGANS
& NURSING CARE TIPS

PART A Fill out this part while viewing the tape. Put a tick (✓) beside the correct word or phrase.

MEASUREMENT OF THE BABY

a) normal range of a mature newborn's weight:
2500 - 4000 gms _____
1000 - 2500 gms _____

b) head circumference and crown-rump diameter measurements should be:
a few cm different _____
within one cm of each other _____

c) the normal range for this measurement is:
40 - 45cm _____
33 - 36cm _____
20 - 22cm _____

d) if head circumference and crown-rump diameter figures are about even, then:
proportion of head to body is even _____
proportion of head to body is not even _____

e) if head circumference is below 33cm it is:
normal and not to worry _____
abnormal and we worry about the size of the brain _____

f) more than 2 or 3 cm difference between head and crown-rump measurement indicates:
a possible hydrocephalic baby _____
a normal difference _____

LISTENING TO INTERNAL ORGANS

a) using a stethoscope, the doctor can listen to heart & lung sounds:
only crudely _____
quite accurately _____

b) blood pressure patterns in babies
constantly change _____
are uniform _____

c) the normal heart rate for a newborn is:
70 - 99 beats per minute _____
100 - 120 beats per minute _____
121 - 140 beats per minute _____

NURSING CARE TIPS

a) a baby's normal position in the crib is:
on his back _____
on his side _____

b) a baby is placed on his side in order to:
reshape his head _____
avoid choking should he regurgitate _____

c) in the first 24 hours, the appearance of excessive yellow color in the skin is:
normal and resolves itself
a sign of blood incompatibility _____

d) a yellowish appearance in the first weeks:
is due to normal breakdown of excessive hemoglobin _____
is abnormal and must be treated _____

N.B. You are now finished with PART A of this section. When the tape is stopped, turn to the next page and complete the review of this section.

PART B REVIEW

Take three minutes to fill out this review below; you may refer back to PART A if you need to.

1) The doctor measures the head cir_____ and the crown-r_____ diameter of a newborn.

2) These 2 measurements should be within _____cm of each other.

3) The normal range for this measurement is _____cm.

4) A hydrocephalic baby is suspected if the difference between head measurement and crown-rump is more than _____ to _____cm.

5) Normal heart rate for a newborn is _____ beats per minute.

6) A baby in the crib should be kept on his side in case of reg_____.

7) A yellow skin in the first 24 hours is a sign of blood in_____.

N.B. You are now at the end of the Review.
Go to the next page to check your answers.

END OF PART B OF SECTION V

ANSWERS TO REVIEW OF SECTION V

1) circumference; crown-rump diameter
2) one cm
3) 33-36 cm
4) 2 to 3 cm.
5) 100-120 beats
6) regurgitation
7) incompatibility

N.B. You are now finished with this Review. Take 5 minutes to look over the whole viewing guide once again before being tested.

END OF THE VIEWING GUIDE

A.

SAMPLE
SHEETS
FROM

THE

TRACTION

TAPE

PACKAGE

SECTION I ORTHOPEDIC DEVICES AND THEIR USE

PART A Fill out this part while viewing the tape.

As the doctor describes each of the orthopedic devices listed below, write down the main use of each device in the space provided.

1) Stainless steel plates
Used mainly for:

2) Stainless steel rods or "rush" nails
Used mainly for:

3) Smith-Peterson Nail and McLaughlin Plate
Used mainly for:

4) Ball & shaft device
Used mainly for:

5) Smith-Peterson Cup
Used mainly for:

N.B. You are at the end of PART A of Section I. Turn to the next page and complete the Review of this section.

PART B REVIEW

Take a few minutes to complete this Review. You may refer back to Part A if you need to.

Match the two columns below by inserting in the blank the letter that corresponds to the correct description for the devices listed on the left.

DEVICE		USE
1) Stainless steel plates	_____	A) FOR REINFORCING THE SHAFT OF A BONE.
2) Stainless steel rods	_____	B) FOR REINFORCING THE FEMORAL HEAD IN ARTHRITIC PATIENTS.
3) Smith-Peterson Nail & McLaughlin Plate	_____	C) FOR COMPRESSION OF BONE ENDS.
4) Ball & shaft device	_____	D) FOR HIP FRACTURES ESPECIALLY IN OLDER PEOPLE.
5) Smith-Peterson Cup	_____	E) FOR REPLACING THE FEMORAL HEAD.

N.B. You are at the end of the Review. Go to the next page to check your answers.

Answers to Review of SECTION I

1) C
2) A
3) D
4) E
5) B

N.B. Turn to SECTION II on the next page. Take a few minutes to read over PART A (pages 4,5,6) before the tape starts again.

B.

SAMPLE SHEETS FROM THE WORK TAPE PACKAGE

SECTION I Definition of WORK & THREE KINDS OF ENERGY

PART A Fill out this part while viewing the tape.

WORK

CIRCLE THE LETTER THAT CORRESPONDS TO THE CORRECT ANSWER:

1) Work and energy are:

A two different and separate things.

B two different aspects of the same THING

COMPLETE THE BLANKS BELOW WITH THE CORRECT WORDS:

2) Work can be defined as a f_____ acting through a d_____.

CIRCLE THE LETTER THAT CORRESPONDS TO THE CORRECT RESPONSE.

3) An example of work being done is:

A pushing a book across a table.

B leaving a book sit on the table.

4) When the line of force on a book doesn't act in the same line as the object is going:

A the complete force still acts on the book.

B only a component of the force acts on the book.

5) When the line of force is the same as the line the object is moving in, then the formula for work can be written as:

A FD

B FS COS θ

C FS

6) In the equation WORK = FS, "S" stands for:

A space

B situation

C distance

THREE KINDS OF ENERGY

COMPLETE THE BLANKS BELOW WITH THE CORRECT WORDS:

7) ENERGY can be defined as the a_____ to do w_____.

CIRCLE THE LETTER THAT CORRESPONDS TO THE CORRECT ANSWER.

8) Because WORK & ENERGY are equivalent, the units of WORK & ENERGY should:

A be different from each other.

B bear no relation to one another.

C be the same for each one.

9) To calculate the work done in lifting a box onto a table, we multiply:

A the length and width of the box by the height.

B the weight of the box by the height.

10) Gravitational Potential Energy (or G.P.E.) is the energy stored in an object because of its height above ground level and the force of gravity on it. The formula for calculating G.P.E. is:

A lwh

B mgh

11) In the equation G.P.E. = mgh, "m" stands for mass, "h" stands for height and "g" stands for:

A ground

B gravity

12) We get gravitational potential energy back from the box:

A by placing it on a high level

B by dropping the box on to the floor

13) Elastic Potential Energy (or E.P.E.) is the energy stored in an object due to:

A the force of gravity on the object

B the object's elasticity or stretchability

14) An example of Elastic Potential Energy is:

A a box dropping to the floor

B a stretched rubber band.

15) Kinetic Energy (or K.E.) is the energy stored in an object due to:

A the force of gravity

B the object's motion

16) An example of Kinetic Energy is:

A a stretched rubber band

B a pebble shot from a sling-shot

N.B. You are now at the end of PART A of Section I. Turn to the next page and complete the Review of this section.

PART B REVIEW

Take five minutes to fill out the review; you may refer back to PART A if you need to.

Complete the blanks below with the correct words or symbols:

1)a)WORK is a f_____ acting through a d_____.

b)ENERGY is the a_____ to do w_____.

2) Gravitational Potential Energy is the energy stored in an object due to its h_____ from ground level and the force of g_____ on the object.

3) The formula for calculating G.P.E. is _____.

4) In "mgh", "m" stands for m_____; "g" stands for g_____ and "h" stands for h_____.

5) Elastic Potential Energy is the energy stored in an object due to the object's e_____ or s_____.

6) Kinetic Energy is the energy stored in an object due to its m_____.

N.B. You are now at the end of this Review.
Go to the next page to check your answers.

END OF PART B OF SECTION I

Answers to Review of Section I

1) a) force; distance
   b) ability; work
2) height; gravity
3) mgh
4) mass; gravity; height
5) elasticity; stretchability
6) motion

N.B. Turn to Section II on the next page. Take 3 minutes to read over PART A (pages 9, 10, 11) before the tape starts again.

APPENDIX III

Sample of Traction Test
and Sample Sheets from the other Tests

NURSING CARE FOR PATIENTS IN TRACTION

NAME: _____

AGE: _____

CLASSROOM: _____

TEST ITEMS

INSTRUCTIONS:

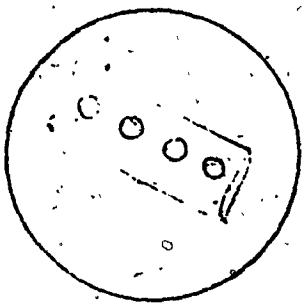
1) Take up to 30 minutes to complete this test. It contains about 40 short-answer items, so pace yourself accordingly. The worth of each item is indicated.

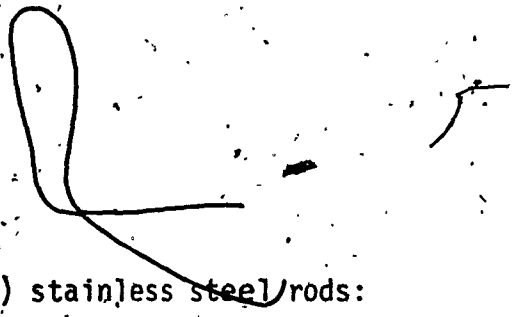
2) In questions where you are asked to complete the blanks, there is one blank for each missing word.

3) Marks on this test will not count for a grade, but will be used to determine a student's retention level when taught by video tape.

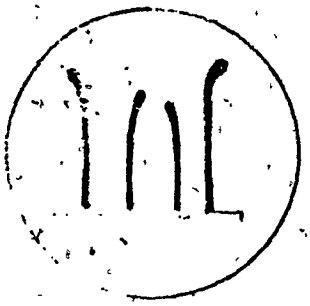
A) Indicate the main use of each of the orthopedic devices illustrated below.

2 pts. 1) stainless steel plates:

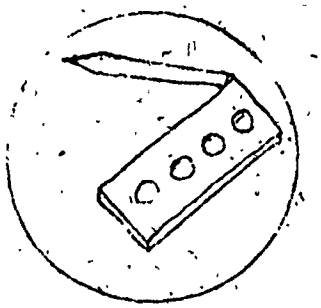




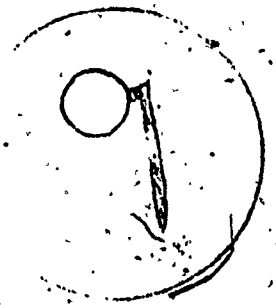
2 pts. 2) stainless steel rods:



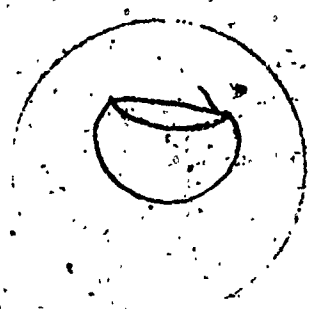
2 pts. 3) Smith-Peterson Nail & McLaughlin plate:



2 pts. 4) Ball & shaft device:



2 pts. 5) Smith-Peterson cup:



B) State the two main reasons for using traction in orthopedics.

1 pt. 6) i)

1 pt 7) ii)

C) State the <u>difference</u> between Skin Traction and Skeletal Traction in terms of the way traction is applied in each case.

2 pts. 8) Skin Traction:

2 pts. 9) Skeletal Traction:

4 pts. D) List the four basic parts of the apparatus used in skin traction.

10) i)

11) ii)

12) iii)

13) iv)

E) State the function of two of the parts listed above. State which part you are referring to.

1 pt. 14) Part: _____ Function _____

1 pt. 15) Part: _____ Function _____

1 pt. 16) The apparatus for skin traction should be changed at least every _____

8 pts. F) List, in order, seven steps in the procedure for changing the tape of a patient in skin traction. An extra point is given for correct order.

17) i)

18) ii)

19) iii)

20) iv)

21) v)

22) vi)

23) vii)

4 pts. G) List the four main parts of the apparatus used in skeletal traction.

24) i)

25) ii)

26) iii)

27) iv)

2 pts. 28) Write a phrase to describe what is meant by "balanced-suspension traction".

6 pts. H) List the six main objectives a nurse should strive for when caring for patients in traction.

29) i)

30) ii)

31) iii)

32) iv)

33) v)

34) vi)

5 pts. I) Write down below up to five major <u>activities</u> which nurses engage in to help achieve their nursing care objectives in treating patients in traction.

35) i)

36) ii)

37) iii)

38) iv)

39) v)

END OF THE TEST

Take a few minutes to re-check your answers.

A.

SAMPLE

SHEETS

FROM

THE

NEWBORN

TEST

1 min. IV) Circle T if the following statements are true and F if the following statements are false:

23) T F The clavicles are extremely durable and are rarely broken in delivery.

24) T F A newborn normally breathes from the chest.

25) T F A newborn's abdomen is normally convex or filled out.

26) T F A newborn's liver is normally small.

3 min. V) Complete the blanks with the correct words.

27) A newborn's color is normally _____.

28) The degree of tightness in a muscle is referred to as _____ _____.

29) If the fontanel or soft-spot is severely elevated, we can suspect _____ _____.

30) A white pupil in the newborn's eye indicates a congenital _____.

31) The presence of a uvula in the newborn indicates that there is no _____ _____.

2 min. VI) Circle the letter that corresponds to the correct answer in the statements below:

32) The bump in the middle of the newborn's chest is usually:

A a cyst due to internal injuries.

B the end of the sternum bone.

C the end of the clavicle.

33) An unusual tuft of hair in the lumbar region of the back indicates:

A excess of hormones.

B skin infection.

C nervous system defect.

34) The normal heart beat for a newborn is:

A 70 - 99 beats per minute

B 100 - 120 beats per minute

C 121 - 140 beats per minute

4 min. VII) Complete the blanks with the correct words.

35) The recommended position for a newborn is to place him on his _____.

36) The newborn is placed in this position so that he won't _____ if he _____.

In determining the maturity of a newborn, the doctor looks at four areas:

37) _____

38) _____ _____

39) _____ _____

40) _____

In measuring the newborn, the doctor is concerned with 2 main measurements:

41) the _____ _____

and

42) the _____ _____ _____

In checking the backbone, the doctor looks at two areas:

43) the _____ region

and

44) the _____ region.

min. VIII) Circle M for those features that indicate maturity and P for those features that indicate prematurity in the statements below:

45)	M	P	Nipples are slightly enlarged.
46)	M	P	Presence of ear cartilege
47)	M	P	A tight sole with no creases.
48)	M	P	Genital areas of a newborn girl are enlarged.

min. IX) Circle T if the following statements are true and F if the following statements are false:

49)	T	F	Cephalhematoma are dangerous and must be treated.
50)	T	F	A newborn normally has eyelashes.
51)	T	F	If a newborn's eyes aren't closed, the cornea could dry out.
52)	T	F	Millia or white spots on the newborn's nose are dangerous and must be treated.
53)	T	F	A testicle that is not descended can develop a cancer more easily than a descended one.

B.

SAMPLE

SHEETS

FROM

THE

NEWTON

TEST

4 pts. 1) State in a few words Newton's First Law of Motion. Your definition should include a statement of the interrelationships between the concepts of equilibrium, movement and velocity.

Circle the letter that corresponds to the correct response:

2) According to Newton, the natural state of objects is that they are:

A generally tending to remain at rest.

B constantly moving with a decreasing velocity.

C each maintaining a uniform motion.

D spiralling towards the closest large mass.

3) According to Newton if you stop pushing an object in a vacuum, it should theoretically:

A keep moving at a constant acceleration.

B stop moving because of friction.

C keep moving at a constant speed.

Complete the blank below:

4) Once you stop pushing a book across a table, it will stop partly because of gravity and also because of the force of _____.

2 pts 5) Define in a few words the concept of INERTIA. Your definition should include reference to moving objects as well as stationary ones.

2 pts. 6) Define in a few words the concept of <u>force</u>, by stating how force is related to acceleration.

7) Describe the relationship between force and acceleration in terms of "proportionality".

8) Give an example of how a change in force affects acceleration.

9) Describe the relationship between mass and acceleration in terms of "proportionality".

APPENDIX IV

Sample of the Questionnaire

QUESTIONNAIRE

I) The following questionnaire asks you to indicate how you feel about this type of presentation as a way of learning. It will help us evaluate its effectiveness. Circle the phrase that best corresponds to what you feel about the following statements:

1) This video tape was a good means of presenting the subject.

STRONGLY AGREE | AGREE | UNDECIDED | DISAGREE | STRONGLY DISAGREE

2) The list of objectives handed out before the viewing was helpful in letting you know what to remember from the tape.

3 4

STRONGLY AGREE | AGREE | UNDECIDED | DISAGREE | STRONGLY DISAGREE

3) The viewing guide which you filled out while viewing the tape allowed you to learn the content better than if you had not had a guide.

STRONGLY AGREE | AGREE | UNDECIDED | DISAGREE | STRONGLY DISAGREE

4) Using objectives and viewing guides with video tapes is a better way to learn than using video tape alone.

3

STRONGLY AGREE | AGREE | UNDECIDED | DISAGREE | STRONGLY DISAGREE

5) The viewing guide tended to interfere with actually viewing the tape.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

6) You could have learned as much from this tape without a viewing guide.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

7) The amount of information conveyed in this presentation was just about right i.e. not too much and not too little.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

8) The review part of each section was a waste of time and could have been eliminated.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

9) The stops after each section were beneficial in allowing you to review material.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

II) Answer the following questions briefly.

1) What parts of this package did you like the most?

2) What parts of this package did you dislike?

3) Would you like to see more presentations like this one where objectives and viewing guides are used with video tapes?

_____ YES

_____ NO

III) FURTHER COMMENTS:

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