A COMPARISON OF FOUR DIFFERENT METHODS OF INSTRUCTION FOR HEALTH FITNESS CLASSES

By

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CHAPTER I

INTRODUCTION

Educational innovation is directed toward qualitative and quantitative improvement of the learning process. It remains a question as to which learning process is the best; however, there appears to be support for the need for efficiency in learning. Educational efficiency is the ratio of the time consumed (student and teacher) to the time taken to consciously control or purposefully direct the process designed to produce the desired changes in behavior (2). There is considerable interest in the concept of matching learning theory with an innovative technique within the method of instruction. The intention is to determine which treatment processes will be the most effective in developing or altering behavior and will best provide efficiency in education for both the student and the teacher.

Knowing and learning have long been recognized as a basic need of man, and the process by which individuals learn has been a major concern of educators for years. Although there seems to be no universal accepted definition of learning, most proposed definitions attempt to recognize learning as something that occurs within the individual which brings about change or changes in behavior (19).

Perkins (13, p. 94) defined learning as a "universal lifelong activity wherein individuals modify their behavior in coping with and adapting to their environment", and he indicated that learning is both a process and a product. Some of the processes which take place between the organism and his environment are "sensing, perceiving, feeling, symbolizing, remembering, abstracting, thinking, and behaving". The product is the resultant changed behavior. If education results only in an increase of knowlege and fails to change the behavior, it is questionable as to whether or not it is accomplishing the purpose of education.

According to Oxendine (12), there are at least four elements that are necessary if the learning process is to take place: (1) A living motivated organism:- learning will not occur without motivation. The individual acts to satisfy a need and participates in an act which will reduce his need or feelings for it. The motivation may be intrinsic or extrinsic, but still represents a driving force for the learner. (2) An incentive which will lead to satisfaction of motives:- incentives are difficult to separate from motivation and share the common base of feelings as a moving force on an individual. (3) A barrier or block which prevents the organism from immediately gaining the incentive:- learning only occurs when there is a problem frustrating the learner. Regardless of the nature of the learning, the learner is kept from a goal.

This situation will cause the learner to appraise the problem and select a method of attack. (4) Effort or activity on the part of the organism to attain the incentive:- after selecting a method of attack, the learner is responsible for personal action to accomplish the goal. The method must produce effort or activity that involves the learner. There seems to be no uniformity in the speed or ease with which different individuals progress through the different phases of the learning process.

Since education is concerned with changes in behavior, educational objectives have been translated into behavioral characteristics and categorized them into three domains: psychomotor, cognitive, and affective (3,9). Annarino (2) has suggested that a fourth domain, physical, should be added to physical education.

The psychomotor domain is concerned with neuromuscular development and harmonious integration of the nervous and muscular systems to produce desired movements. The cognitive domain refers to the development of intellectual skills and abilities, knowledge and fact. The affective domain is concerned with the individual's social, personal and emotional development. The fourth domain, the physical, refers to organic development and proper functioning of the body's systems so that the individual may adequately meet the demands placed on him/her by the environment (2).

Annarino stated that there should be a comprehensive set of performance objectives that will be reflected in the content and methodology of a curriculum that has meaning and significance (p. 70).

Several studies have been conducted comparing the effects of various teaching methods on the development of knowledge (17,21). However, the author has been unable to find studies that add the dimensions of attitude and behavior and their effects on learning.

Statement of the Problem

The purpose of this investigation was to compare the effects of four different methods of teaching health fitness concepts on student achievement in knowledge gained related to health and fitness, physical improvement, and positive attitudes toward exercise and physical activity. The health fitness concepts were taught using four different methods of instruction in a one-semester health fitness course at Oral Roberts University during the spring semester of 1980:

Sub Problems

1. A traditional classroom method was used with the instructor giving the lecture, followed by a class discussion.

2. Rather than a lecture, the instructor played a video cassette tape of the lecture in class and followed

it with a class discussion.

3. The video cassette lecture was made available for the students to watch outside of class, and the class time was devoted to a class discussion.

4. The students received no lecture in class nor video cassette lecture in or out of class, but were given a study guide over the text. The class time was devoted to a discussion of the material they were assigned to read.

Hypotheses

1. All four classes will demonstrate significant improvements in the areas of knowledge gained related to health and fitness, physical improvements, and positive attitudes toward exercise and physical activity.

2. There will be no statistically significant difference among the four classes exposed to four different teaching methodologies in knowledge gained, physical fitness improvement, and development of positive attitudes toward exercise and physical activity.

Significance of the Study

This investigation provides experimental data regarding the potential of video cassette lecture method of instruction as a supplement or replacement for lecture type instruction. Data gathered from this study could provide support for institutions to develop a library of taped lectures providing students with constant avail-

ability to the lectures or in-class use of the taped lectures.

The results of this study could encourage college and university educators to utilize the dimension of video cassette instruction as an educational tool to aid students at all levels of competency.

The basic concepts of health fitness could be programmed for students initially, while accelerated material could be programmed to challenge advanced students.

The flexibility of the time schedule offered through the use of video cassette lectures outside the classroom may be a desirable alternative to the student and the instructor.

Assumptions

1. All four classes will be approximately the same in number.

2. The number of female students will be approximately the same as the number of male students.

3. The time of day the classes are held will not affect their behavior.

4. The students will be at approximately the same level of fitness, knowledge, and attitude when they enter the class.

Limitations of the Study

This investigation is limited in the following ways:

1. No attempt was made to change the regular Oral Roberts University enrollment pattern of the Health Fitness course.

2. No attempt was made to control interest and motivation of the students. The course is required of ORU students in their first semester of classes.

3. The instructor lecturing in the classroom was not the same instructor on the video cassette taped lectures.

4. The classes were not equal in numbers.

5. The written post-test for knowledge gained was given in two parts; one at mid-semester and the other at the end of the semester.

Delimitations of the Study

The study was restricted in the following ways:

1. Attendance was required.

2. Only four different teaching methods were considered in this study.

3. Only four classes were tested for this study.

CHAPTER II

REVIEW OF LITERATURE

Spurred by the nation's quest for ever-improved quality in educational programs, educators have been turning their attention to instructional possibilities of mass media communication techniques (14).

Television emerged as a powerful instrument of education communication in the early 1950's. The offering of televised courses for college credit was one of the first instructional uses for television (16). Today, video cassette taped lectures are used for teaching almost every subject in the college curriculum.

Snider (18) defines instructional technology as a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction.

Hixson (7, p. 25) states, "It is no longer a question of whether or not we should use instructional television in our programs of physical education", but "How we can best present our areas of education through the medium of

television?" The challenge of keeping up with technology is a problem. Like other curricular areas, physical educators face the prospect of more material to be taught to more students, by too few teachers, in too little space, with too few facilities; however, adapting our teaching to television may be part of the answer to these problems.

The use of instructional television offers many advantages. Among the benefits are:

1. Increased motivation of students when they are given optional ways to reach a learning goal and allowed to progress at their own pace.

2. The tendency for many students to learn faster and get better grades when they control the learning process.

3. The faculty are forced to better prepare for lectures, thus an improved quality of teaching.

4. The course materials are standardized which will assure that all students will be exposed to the same content.

5. Shifting the instructor's work load away from lectures and tests, allow more time for interviews, counseling and clinical supervision.

6. Because of the continued revision and updating of courses as the material is used, the courses seldom become static.

7. More students can be taught with less faculty time in the classroom (1).

8. Better viewing is possible through the close-up techniques offered in instructional television.

9. Each student feels the teacher is communicating directly with him. Students tend to focus their attention to the television teacher.

10. The pre-recorded lectures make it possible for the teacher to continue when ill or absent.

11. Viewing spaces need not be darkened since television produces its own light. Students can perform supplementary learning activities such as taking notes or sketching during the telecast (7).

Hichens (18) comments that with the demand for education outstripping educator's income, more efficient and effective learning is vital. Instructional technology has proven its ability to increase the rate of learning. It can enable the teacher to better utilize his/her time by reducing the teacher's administrative tasks and taking over some of the teacher's routine job of information transmission. Thus, the teacher would be able to spend more time teaching, inspiring the students to learn and encouraging them to apply newly acquired information in beneficial ways.

When taped lectures meet their potential in the quality of material, it will allow the instructor to be measured by the degree to which the student learns (not the degree to which the teacher "teaches") (5).

Instructional television has probably been subjected

to more research than any other instructional innovation (16). Of the research done, young people, adults and professionals out of school are very lightly represented among the subjects studied. College students and military personnel are very heavily represented indicating, as usual, that research is done where populations are readily available that can be studied under experimental controls. While 31% of the research done has been with college students, only about 7% of the studies have been done related to physical education (17).

The most fully researched subfield of instructional television has been student participation in the teaching learning process. The research in many forms, with many kinds of subject matter, consistently supports active student participation contributing a substantial amount to learning. For example, Michael and Maccoly (1953) used active responding in only half of a film. The only significant learning gains they found were on material taught in the half to which the responses had been made. This kind of finding has been reported over and over again (15,16). Few instructional elements can be introduced into television with as much confidence that it will be helpful (10).

The question of whether or not the teacher's attitude toward educational media is reflected in the student's learning was studied by Hartley (6). The aim of Hartley's research was primarily to determine if he could construct a valid and reliable questionnaire that would measure

teacher's attitude toward the new media. A questionnaire was developed using (the orthodox) Likert scaling procedures, submitting a large number of items to standardization groups to produce eventually a short scale containing items known to discriminate between teachers who were favorable and teachers who were hostile to new educational media.

Hartley's experiments were limited in that the numbers involved were extremely small; however, he concluded that if there is a teacher in the system, he/she will probably quite unintentionally influence the results obtained. Sometimes, this influence may not be apparent to an observer; but, on other occasions it may be obvious. Teacher attitudes have an important part to play in student learning (6).

At present, there are differences of opinion concerning the possible and probable consequences of giving students a test before the instruction. There is evidence that pre-tests can have orienting, motivational and, hence, teaching functions, in addition to the sought for testing function. Warr (20) carried out an experiment with foremen in a weekend course who were studying accident prevention. Forty-three were divided into three groups. Group I took half the posttest as a pre-test before instruction. Group II took the other half of the post-test as a pre-test. Group III did not take a pre-test. The results were: performance was best on the questions

previously seen; performance was next best on those questions not seen by the pre-test group; performance of Group III was poorest. Therefore, as Warr said, "Pre-test can have a teaching as well as testing function".

The effects of pre-testing or post-testing performance were studied by Hartley (6). He compared six experimental studies done by colleagues and reached the following conclusions: if the instruction is efficient to the point that all students learn to criterion, the effects of administering a pre-test on post-test performance are unlikely to manifest themselves. However, if the students involved are older and the learning is less efficient, it may be profitable to administer a pre-test first. The findings suggest that in such situations not only does a pretest alert one's expectations to what is required, but it seems to assist in the organization of other related material in order that it can be easily remembered."

For years, tape recording equipment has been used in many phases of education. Much of the use of this equipment in the learning process has been supplementary in nature. A well known example is the use of tapes in language courses; however, research on the use of tapes in language courses has shown there is still some question regarding the effectiveness of the language laboratories (14).

Very few studies have attempted to assess the effectiveness of direct teaching by tape recorded lecture. In

1962, Popham (14) used taped lectures in both graduate and undergraduate courses. In both of these studies, the students listened to the same tape recorder at the same time and in the same room, much as in a normal class meeting. Following each recorded lecture, the students engaged in discussion groups. Popham found no significant differences in achievement between these students and control groups who received the traditional live lecture presentation.

Menne's study (11) was done with an introductory psychology course at Iowa State University which is taught every quarter. During the winter and spring quarters of 1967, the lectures were recorded, and notes were taken on the blackboard material used by the instructor during the presentation of his lectures. Later the tapes were edited, cutting out purely topical references, and the blackboard notes were assembled into booklet form. The instructor, whose lectures were recorded, was also the lecturer for both replications of the experiment, and he made no basic changes in the presentation of his material. Thus, what the experimental subjects heard on tape was almost exactly what they would have heard had they attended live lectures. It was hypothesized that there would be no significant statistical differences in achievement between the students who attended the lectures and those who used the tapes exclusively.

The students who signed up for the section could

choose between taking the course by traditional lecture or by taped lecture. In the fall, 149 chose tape (experimental group), 211 chose live lecture (control group); in the spring, 141 chose tape and 197 chose the traditional lecture method. Each experimental subject was issued a tape recorder, a complete set of lecture tapes, a booklet containing the usual blackboard material and a schedule of the lecture topics to be given to the control group. The experimental subjects agreed (1) not to attend the live lectures, (2) not to allow control subjects to listen to the tapes, and (3) not to copy the tapes issued to them. Each experimental subject was left entirely free to proceed at his own pace. The students were, however, allowed to attend class sessions when supplementary movies were shown, and were required to take the three exams given over the course material. All exams were of the objective, multiple choice type. Thus, no distinction between control and experimental subjects could be made in grading.

In all cases, the difference was insignificant, with the exception of the second exam in the spring quarter. The experimental group had a mean score of 32 out of 45 as compared with 30 for the control group. This difference was statistically significant at the .05 level.

This study confirms earlier findings by Popham (14) that taped lectures can be effective as the traditional lecture in teaching undergraduate college students. It was

predicted that students, given a set of tapes and a recorder, could and would learn as much about the course material as would the students who attended the regular class lectures; and this is, in fact, what the results of the experiment indicated.

Jamison, Suppes, and Wells (8) did a review of 15 field experiments. Siberman (1962) found that all of them showed programmed instruction taking less time to complete than traditional instruction. In nine of the studies, students participating in the programmed instruction groups scored higher than those in the traditional instruction groups. In the other six studies, there was no significant difference between the two approaches.

Large (1972) reported that between 1960 and 1964, there were 112 comparative studies conducted that matched programmed instruction and traditional instruction. Of these studies, 41 percent showed programmed instruction to be superior, 49 percent found no difference and 10 percent found programmed instruction to be less affective than traditional instruction.

The current emphasis in programmed instructions seems to have changed from direct comparative studies of effectiveness to detailed studies of how to improve the programs, how to increase student interest and how to adopt programmed instruction to unusual educational settings.

Hartley (6) concluded that of 12 studies known to him

that compared programmed instruction alone with programmed instruction "integrated" with the teacher, 11 found the integrated method to produce better results. This same conclusion is reported by Chu and Schramm (1968).

In the opinion of A. A. Lumsdaine (10, p. 64), "auto-instructional methods may represent the most important innovation in education since the advent of the textbook". One reason for this opinion is the fact that the development of programmed self-instructional material is closely tied to the use of empirical dots obtained from students' responses as a basis for program revision. The development of teaching machines and programs for self-instruction, requiring the participation of the student, has proceeded rapidly during the past few years. Many proponents of teaching machines believe that the auto-instructional concept and its implementation are likely to have very important implications for the future of instructional methods, and may even revolutionize education (10).

There are still problems which must be investigated to determine to what extent instructional television can be used effectively in physical education. Wilbur Shramm (4) is of the opinion that, "The chief problem of using satellites for education are now ground problems not space problems. The technology of equipment has outrun the research as to its most effective use. The tools are so fascinating that we have watched them develop and admire

them and have neglected the more mundane and messier questions of how to use them" (p. 19).

CHAPTER III

METHODS AND PROCEDURES

This chapter describes the procedures utilized while comparing the effects of four different methods of teaching health fitness concepts on student achievement in knowledge gained related to health fitness, physical fitness improvement, and positive attitudes gained toward exercise and physical activity.

The Subjects

The subjects for this investigation were 147 college students enrolled in the Health Fitness Concepts course at ORU in the spring semester of 1980. Those enrolled were both freshmen and upper class transfer students at ORU for their first semester. No attempt was made to compare different ages or grade classifications. Although every student was expected to complete all of the tests given to them, some did not. Therefore, those who did not attend class or complete the entire pre-test and post-test were eliminated from the study.

The students had a choice when they enrolled as to which class they wanted to attend. There was no attempt made to randomly assign the students. The students were

not told which method of instruction their class would be exposed to until the second week of the semester. The classes met weekly as follows:

1. 7:50 - 9:30 a.m./Wed.
2. 4:10 - 5:50 p.m./Wed.
3. 2:10 - 3:50 p.m./Thurs.
4. 4:10 - 5:50 p.m./Thurs.

The Pre-Test Examination

A pre-test was given to all four classes to determine the student's present level of knowledge, physical fitness, and their attitude toward exercise and physical activity. The knowledge test consisted of one hundred questions with a combination of multiple choice and true-false questions. The test was prepared by Dr. Paul Brynteson and Dr. David Cundiff of ORU and is accepted at face validity. The test was not returned or discussed with the students following the pre-test.

Physical fitness was evaluated by the student's time on the field test developed by Kenneth Cooper (Way 87). As Cooper recommends, the male students ran 1½ miles, and the females ran 1¼ miles. The students were encouraged to complete the test in their best possible times.

Attitude toward exercise and physical activity was measured by using the MacPherson-Yahosz Attitude to Exercise and Physical Activity test. In addition to these three tests, each student was weighed at the beginning of

the semester during the regularly scheduled meeting time of the classes.

The Post-Test Examination

The same tests that were administered as a pre-test were given to post-test the students. The post-tests were administered the last two weeks of the semester during the regularly scheduled meeting times of the class.

Procedures

The students in each of the four classes met together in the aerobics center room 114 for class. The students come to class dressed in gym clothes so they were prepared to participate in the laboratory experience which followed the classroom presentation.

Class one viewed, for approximately 30 minutes, a video cassette taped lecture by Dr. Paul Brynteson which covered the material in the required reading in the text. The classroom was equipped with a video cassette player and two 19" monitors for viewing the taped lecture. Following the lecture, the investigator lead a discussion covering the key concepts for the chapter and answering questions.

The second class came having had the option of viewing the same taped lecture on their own time in the library. Students were given instructions for running the video cassette tape in the library and informed of the

library hours. Classroom time was spent discussing the key concepts for the chapter and answering any questions on the material. The discussion time was led by the investigator.

The third class was given a lecture by the investigator on the assigned chapter. The lecture was followed by a discussion of the key concepts and question and answer time over the material.

The fourth class read the assigned chapter outside of class and was given a study guide to follow for each chapter. Classroom time was spent with the investigator leading a discussion covering the key concepts for the chapter and answering questions. Each student participated in an exercise laboratory experience which followed the classroom time. Time spent in class and during the laboratory followed the ORU Health Fitness syllabus (see Appendix).

Computation of Results

A Statistical Analysis System (SAS), which is a commercial statistical package, was run on an IBM-4331 computer. A software package was utilized with the analysis of variance using the difference method, and General Linear Model procedures were used to test for an analysis of covariance. A t-test compared the means of various subgroups to determine if significant differences existed. The .05 level of significance was deemed acceptable. The

package was run at the Oral Roberts Evangelistic Association installation.

CHAPTER IV

RESULTS

Results of the Pre-Test and Post-Test of the Study

The author has compared the following four teaching methods of instruction for a one-semester course on health fitness concepts:

1. A traditional classroom method with the instructor giving the lecture, followed by a class discussion.

2. Rather than a lecture, the instructor played a video cassette taped lecture in class, and followed it with a class discussion.

3. The video cassette lecture was made available for the students to watch outside of class, and the class time was devoted to a class discussion.

4. The students received no lecture in class nor video cassette lecture in or out of class, but were given a study guide over the text. The class time was devoted to a discussion of the material they were assigned to read.

An analysis of variance was used to see if a significant difference existed between the pre-test and post-test. The differences between responses shown in the pre-test and post-test were evaluated for each of the four

variables tested, knowledge, field test times, weight, and attitude for each class. The following data were received from the procedures applied in the study.

Table I represents the analysis of variance for the differences from the pre-test to the post-test for combined males and females. The table shows that among the four teaching methods used there was no statistically significant difference on any of the four variables tested.

TABLE I

ANALYSIS OF VARIANCE COMPARING THE SIGNIFICANCE OF THE DIFFERENCES FROM TEST I TO TEST II FOR COMBINED MALES AND FEMALES

Variable	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squared	F Ratio	Prob-ability
Knowledge	Treatment	121	840.71	210.18	1.92	.111
	Error		12784.89	109.27		
	Total		13625.61			
Weight	Treatment	106	2.12	.53	.44	.782
	Error		135.19	1.22		
	Total		137.31			
Field Test	Treatment	114	251.97	62.99	.8	.53
	Error		8059.02	79.01		
	Total		8310.99			
Attitude	Treatment	105	1278.23	319.55	.44	.78
	Error		72908.404	721.86		
	Total		74186.64			

Table II represents the analysis of variance for the differences from the pretest to the post-test for males. The table shows that among the four teaching methods used there was no statistically significant differences on any of the four variables tested.

TABLE II

ANALYSIS OF VARIANCE COMPARING THE SIGNIFICANCE OF THE DIFFERENCES FROM TEST I TO TEST II FOR MALES

Variable	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squared	F Ratio	Prob-ability
Knowledge	Treatment	46	617.67	205.89	2.02	.12
	Error		4597.10	102.16		
	Total		5214.78			
Weight	Treatment	43	84.74	28.25	.43	.7351
	Error		2782.42	66.25		
	Total		2867.16			
Field Test	Treatment	44	.91	.31	.34	.798
	Error		38.51	.89		
	Total		39.42			
Attitude	Treatment	43	538.21	179.40	.45	.72
	Error		16724.74	398.21		
	Total		17262.956			

Table III represents the analysis of variance for the differences from the pre-test to the post-test for females. The table shows that among the four teaching methods used there was no statistically significant differences on any of the four variables tested.

TABLE III

ANALYSIS OF VARIANCE COMPARING THE SIGNIFICANCE OF THE DIFFERENCES FROM TEST I TO TEST II FOR FEMALES

Variable	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squared	F Ratio	Probability
Knowledge	Treatment	74	465.49	155.16	1.35	.265
	Error		7941.38	115.09		
	Total		8406.87			
Weight	Treatment	62	22.85	7.62	.08	.9637
	Error		5220.16	91.58		
	Total		5243.01			
Field Test	Treatment	69	1.87	.60	.41	.7513
	Error		96.08	1.48		
	Total		97.89			
Attitude	Treatment	61	1707.05	569.02	.58	.63
	Error		54614.55	975.26		
	Total		56321.60			

Table IV represents a *t* ratio for all four classes tested for significant increases from the pre-test to the post-test for combined males and females. Of the four variables tested, there was a statistically significant improvement in knowledge gained, field test times and attitudes toward exercise and physical activity, all at the .01 level of significance. There was no statistically significant weight loss from the pre-test to the post-test.

TABLE IV

OVERALL CHARGES FROM TEST I TO TEST II FOR COMBINED MALES AND FEMALES

Variable	Class	Mean T1 - T2	Difference	N	t	Probability
Knowledge	1	54.5-80.8	26.3	37	11.97	.0001
	2	56.1-81.9	25.8	34	15.25	.0001
	3	60.5-81.9	21.4	36	16.04	.0001
	4	62.2-81.7	19.5	15	9.42	.0001
	X	57.7-81.6	23.9	122	24.87	.0001
Field Test	1	11.8-10.8	-1.	36	7.31	.0001
	2	11.9-10.8	-1.1	27	4.23	.0003
	3	11.2-10.5	- .7	37	4.99	.0001
	4	12.4-11.4	-1.	15	3.37	.0046
	X	11.7-10.9	- .8	115	9.84	.0001
Weight	1	154-153	-1.	33	- .17	.8642
	2	147-141	-1.	31	.62	.5391
	3	142-142	0	33	- .76	.4532
	4	168-168	0	10	.12	.9074
	X	149-149	0	107	.01	.9913
Attitude	1	200.6-206.8	6.2	28	1.63	.1155
	2	202.5-207.8	5.3	32	1.82	.0787
	3	201.2-207.9	6.7	33	1.54	.1345
	4	194.4-198.8	4.4	13	1.16	.2686
	X	201.2-208.3	7.1	106	2.76	.0069

Table V represents a t ratio for all four classes tested for significant increases from the pre-test to the post-test for males. Of the four variables tested there was a statistically significant change at the .01 level in the areas of knowledge gained, and field test times. There was no statistically significant difference in weight or in attitudes toward exercise and physical activity.

TABLE V

OVERALL CHANGES FROM TEST I TO TEST II FOR MALES

Variable	Class	Mean T1 - T2	Difference	N	t	Probability
Knowledge	1	55.8-80.5	24.7	14	8.75	.0001
	2	55.9-85.6	29.7	10	7.31	.0001
	3	59.3-80.8	21.5	17	10.60	.0001
	4	65.3-83.8	18.5	6	7.88	.0005
	X	58.3-82.1	12.8	41	15.90	.0001
Field Test	1	11.9-10.7	1.2	13	5.46	.0001
	2	11.7-10.6	1.1	9	2.58	.0326
	3	11.0-10.2	+ .8	16	4.49	.0003
	4	13.0-12.1	+ .9	7	2.49	.0471
	X	11.7-10.7	+1.0	45	7.48	.0001
Weight	1	180.2-178.2	-2	12	.92	.3757
	2	179.7-175.8	-3.9	11	1.05	.3177
	3	160.8-169.9	- .9	15	.26	.8008
	4	184.8-184.6	- .2	6	.07	.9444
	X	174.1-172.3	-1.8	44	1.35	.1843
Attitude	1	192.7-202.1	7.4	11	1.17	.2689
	2	205.7-210.1	4.4	12	.57	.5805
	3	203.1-207.2	4.1	15	1.17	.2591
	4	197.2-195.2	-2.	6	- .48	.6525
	X	200.4-205.1	4.7	44	1.52	.1354

Table VI represents a *t* ratio for all four classes tested for significant increases from the pretest to the post-test for females. Of the four variables tested, there was a statistically significant gain in knowledge and field test times at the .01 level. There was improvement at the .05 level of significance in attitude toward exercise and physical activity. There was no statistically significant change in weight.

TABLE VI

OVERALL CHANGES FROM TEST I TO TEST II FOR FEMALES

Variable	Class	Mean T1 - T2	Difference	N	t	Probability
Knowledge	1	53.7-80.9	27.2	23	8.74	.0001
	2	56.2-80.4	24.2	24	15.23	.0001
	3	61.5-83.	21.5	19	11.86	.0001
	4	60.1-80.3	20.2	9	6.36	.0002
	X	58.3-81.2	22.9	75	19.01	.0001
Field Test	1	11.8-10.8	1.	23	5.16	.0001
	2	12.0-10.9	1.1	18	3.27	.0045
	3	11.9-10.7	1.2	21	2.92	.0089
	4	11.3-10.6	.9	8	2.31	.0538
	X	11.7-10.9	.8	70	6.89	.0001
Weight	1	139.5-138.3	-1.2	21	- .54	.5966
	2	128.7-129.3	.6	20	- .36	.7242
	3	125.4-127.2	1.8	18	-1.86	.0812
	4	142.7-142.5	- .2	4	.09	.9354
	X	133.3-132.5	- .8	63	- .99	.3280
Attitude	1	205.7-209.7	4	17	1.13	.2751
	2	200.5-206.5	6	20	2.66	.0158
	3	203.2-208.5	5.3	18	1.30	.2127
	4	192-201.8	9.8	7	1.81	.1208
	X	201.8-207.4	5.6	62	2.31	.0246

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this investigation was to compare the effects of four different methods of teaching health fitness concepts. The variables tested were knowledge gained related to health fitness, physical fitness improvement, weight loss, and attitudes toward exercise and physical fitness.

Conclusions

Based on the data, the following conclusions were formulated:

1. When all four classes were compared, there was no statistical difference at the .05 level of significance among the four methods of instruction on any of the four variables tested.

2. The results from combined males and females of all four classes showed statistically significant improvement in the knowledge gained, positive attitude change toward exercise and physical activity, and field test times at the .01 level. There was no change in weight among the students.

3. The results from the males of all four classes

showed statistically significant improvement in knowledge gained and field test times at the .01 level. There was no statistically significant change in weight or in attitudes toward exercises and physical activity.

4. The results from the females of all four classes showed statistically significant improvement in knowledge gained and in field test times at the .01 level. There was improvement at the .05 level of significance in attitude toward exercise and physical activity. There was no statistically significant change in weight.

Based on the data presented, it may be concluded that all four methods of teaching produced improvement in knowledge gained, field test times and attitudes toward exercise and physical acitvity. However, of the four teaching methods used, none were statistically superior to the others. As reflected in the scores of the students, any of the four methods of instruction would produce similar results as an effective method of teaching a course on health fitness concepts as outlined in the procedures of this study.

Recommendations

Further research is recommended to determine whether the students of any of the four teaching methods would retain the desired information for longer periods of time. A similar study might be done using the same instruction in the classroom as on the taped lectures. A follow-up evalu-

ation could be done to determine the number of subjects in the classes that show a continued interest in exercise and physical activity and which of the four methods of teaching were used.

A SELECTED BIBLIOGRAPHY

(1) Adams, Velma A. "The Gospel of Media at Brigham Young University." Planning for Higher Education, No. 1 (February, 1976), pp. 6-7.

(2) Annarino, Anthony A., Charles C. Cowell, and Helen W. Hazelton. Curriculum Theory and Design in Physical Education. St. Louis: C.V. Mosby, Co., 1980.

(3) Bloom, Benjamen. Taxonomy of Educational Objectives. Handbook I: The Cognitive Domain. New York: David McKay Co. Inc., 1956.

(4) Chu, Godwin, Wilbur Schramm. "Learning from Television: What the Research Says." Washington, D.C.: National Association of Broadcasters, 1968.

(5) Gabriel, Ofiesh D., Wesley C. Meierhenry. "Papers From the First Annual Convention of the National Society for Programmed Instruction." Trends in Programmed Instruction. National Education Association, 1964.

(6) Hartley, James. "Factors Affecting the Efficiency of Learning from Programmed Instruction." Audio-Visual Communication Review, Vol. 19, No. 2 (Summer, 1971), pp. 133-148.

(7) Hixson, Chalmer G. "Status and Potential of Instructional Television For Physical Education." Journal of Health Physical Education and Recreation, Vol. 33, No. 5 (March-June, 1962), pp. 25-27.

(8) Jamison, Dean, Patrick Suppes, and Stuart Wells. "The Effectiveness of Alternative Instructional Media: A Survey." Review of Educational Research, No. 44 (Winter, 1974). pp. 1-67.

(9) Krathwohl, D. R. Taxonomy of Educational Objectives: Handbook II. The Affective Domain. New York: David McKay Co., Inc., 1964.

(10) Lumsdaine, Arthur A. "Student Response in Programmed Instruction." National Academy of Sciences, National Research Council. Washington: 1961.

(11) Menne, John W., Thomas E. Hannum, John E. Klingersmith, and Dennis Nord. "Use of Taped Lectures to Replace Class Attendance." AudioVisual Communication Review, Vol. 17, No. 1 (spring, 1969), pp. 42-46.

(12) Oxedine, Joseph B. Psychology of Motor Learning. New York: Appleton-Century-Crofts, 1968.

(13) Perkins, Hugh V. Human Development and Learning. Calif.: Wadsworth Publishing Co., Inc., 1969.

(14) Popham, W.J. "Tape Recorded Lectures in College Classroom II." AudioVisual Communication Review, Vol. 10 (1962). pp. 94-101.

(15) Randall, S.E. Research Results in Three Largh Televised Foreign Language Courses in the Elementary School Programs. Paper read at the International Conference on Modern Foreign Language Teaching, West Berlin, Germany, 1964.

(16) Saettler, Paul. A History of Instructional Technology. New York: McGraw-Hill Book Company, 1968.

(17) Schramm, Wilbur. "What the Research Says." Quality in Instructional Television. Hawaii, Honolulu, 1972.

(18) Tickton, Sidney G. To Improve Learning: An Evaluation of Instructional Technology, Vol. I, New York: R. R. Bowker Co., 1972.

(19) Travers, John F. Learning: Analysis and Application. New York: David McKay Co., Inc., 1965.

(20) Warr, P. B., M. W. Bird, and N. Rackham. Evaluation of Management Training. London: Grower Press, 1970.

(21) Whittich, Walter A., Charles F. Schuller. Instructional Technology. New York: Harper and Row Publishers, 1973.

APPENDIX A

COURSE SYLLABUS

O R A L R O B E R T S U N I V E R S I T Y

DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION

DR. PAUL BRYNTESON, CHAIRMAN

A SYLLABUS AND GENERAL STUDY GUIDE FOR

HPER 001* Health Fitness I

1980-81

Prepared by

HPER Aerobics Staff

HPER 001* HEALTH FITNESS I

Departmental Policies: See HPER Departmental Policies Booklet.

Course Description

The purpose of this course is to provide an understanding and personal appreciation of the relationship of physical activity and fitness to health, so that the individual will select an appropriate personal lifestyle necessary to produce optimal life-long health and well-being. This is the first course of a two-part course. Emphasis in this course is placed upon the concept of fitness and the cardiorespiratory system, nutrition and body composition.

General Goals of the Course

The goal of this course is to provide students with a basic orientation to the place of physical activity in the life of man today. During the past sixty years modern technology has lessened the amount of necessary physical work required for the average person. The human body needs physical activity for the maintenance of good health.

Through the exposure of basic information from the areas of physical education, physiology, medicine, recreation and safety, the student will have the opportunity to develop a philosophy related to his physical well-being on the basis of factual information. It is anticipated that this new concept will help the student to realize the maximum benefits from the program of regular health and physical education at Oral Roberts University.

The goals of the course are that at the completion of the course, the student should be able to answer the following questions?

General
1. What is fitness?
2. How is fitness assessed?
3. How is fitness achieved?

Personal
1. What is my level of fitness?
2. How much fitness do I need?
3. How much fitness do I want?
4. How do I achieve and maintain that level of fitness?

Terminal Objectives

Based upon the information presented and the class experiences gained through the use of the required textbook material, lectures, demonstrations, and other education media, the student enrolled in HPER 001* will be expected to:

1. Identify and describe the relationship between the concepts of physical activity, physical fitness, motor ability, total fitness, and health.
   a. Describe the concept of hypokinetic diseases.
   b. Describe the cultural factors which have contributed to hypokinetic diseases.
   c. Describe the "whole person" concept.
   d. Define and describe the components of physical fitness.
   e. Define and describe the components of motor ability.
   f. Describe the concept of Total Fitness.

2. Measure and determine his/her own level of physical fitness and physical activity level.
   a. Take a variety of physical fitness tests which measure each component of physical fitness.
   b. Identify various tests of fitness and describe what component of fitness each measures.
   c. Relate the test results to one's personal level of fitness.
   d. List the risk factors related to heart disease and the preventive measures to lower the risk factors.
   e. Analyze one's daily physical activity patterns.

3. Prescribe a personalized fitness program for each of the components of physical fitness.
   a. Define, describe and apply the concept of overload, intensity, duration and specificity to the development of the components of physical fitness.
   b. Demonstrate various methods and exercises to develop the components of physical fitness.
   c. Describe the concept of aerobics.
   d. Describe the role of diet and nutrition in a fitness program.
   e. Select a personal goal (e.g. ARETE) to guide participation in your fitness program and explain why you chose your ideal.

4. Improve or maintain your own fitness as a result of participating in the personalized fitness program.
   a. Pursue the goal which you established in your exercise prescription.
   b. Keep a log of your program and progress.
   c. For men, earn at least an average of 25 aerobics points per week, run the field test under 12:00 and be less than 22% fat.
   d. For women, earn at least an average of 20 aerobics points per week, run the field test under 12:00 and be less than 32% fat.

Prerequisite

It is the student's responsibility to have completed the Medical Assessment administered by ORU's Student Health Services and the Human Performance Laboratory before participating in the exercise portion of the course. If the student does not complete this, he will be subject to fail the course. Furthermore, if the student has any health problem which may restrict his participation, he should notify his instructor! The student must present to the instructor a written note from ORU's campus physician of any limitation he may have for meeting the standards of the course.

Class Organization, Topical Listing and Sequence

The class will meet one day per week for 100 minutes. The first part of the class will generally be to view video tapes via television. An introduction will precede and a discussion will follow each tape. The remainder of the class will be devoted to an exercise experience. Come to class dressed for activity. All classes meet in AC 114.

Week	Discussion Topic	Laboratory Exercise
1	Medical Assessment	None
2	Lifestyle and Health	Check out clothing
3	Concept of Health Fitness	Sample tests
4	Cardiorespiratory Fitness I	Warm-up/Form Jogging
5	Cardiorespiratory Fitness II	Exercise by HR
6	Cardiorespiratory Fitness III	1-mile @ 70%
7	Cardiorespiratory Fitness IV	2-miles @ 70%
8	TEST I	3-miles @ 60%
9	Nutrition - Food Analysis	2-mile prediction
10	Nutrition - Weight Control	Swimming Proficiency Test
11	Musculoskeletal Fitness I	Calisthenics/Interval Training
12	Musculoskeletal Fitness II	Weight Training/isometrics
13	Injury Prevention and Treatment	Field Test
14	TEST II	Cycling/Rope Skipping/Reweigh
15	Open Discussion	Open Lab

Grading

The students will be graded in 5 criteria. A minimum standard must be achieved on each criteria to pass the course. If the minimum standard is achieved for each criteria, the total points earned are added and grades given as follows:

Points Earned	Grade
90-100	A
80- 89	B
70- 79	C
60- 69	D
0- 59	F

The 6 Criteria Are:	Possible Points
1. Knowledge as measured by tests, quizzes, and assignments	70
2. Physical activity as measured by aerobics points	10
3. Cardiorespiratory fitness as measured by field test	10
4. Body composition fitness as measured by percent fat	10
5. Attendance (may add or subtract points)	--
6. Participation (may add or subtract points)	--
	100

1. Knowledge

Two written objective tests will be administered during the semester. Each test will consist of multiple choice questions over the materials covered in class plus the assigned readings and tapes. In addition to the two tests, an assignment will be given in class which involves the student to record and analyze diet and activity for three days. This is due when Test II is given. In addition, three unannounced quizzes will be given during the course of the semester. Each quiz will count three points. They cannot be made up if missed. Minimum standard: 55% of total points.

2. Aerobics Points

Aerobic points will be counted for approximately the last 12 weeks of the semester. While the grade is based upon an average points per week for the entire semester, at least some points should be earned each week. It is the students' responsibility to fill out the computer card accurately. If a student is excused from aerobic points for medical reasons for any given week, the student must notify the instructor of this and turn in an aerobic card indicating number of days excused per week.

Points Toward Grade	Aerobic Point Average Men	Women
0	<15	<10
6	15*	10*
7	17	12
8	20	15
9	25	20
10	30	25

*Minimum standard

3. Field Test

The field test will be administered once during the semester. The field test is 1.50 miles for men and 1.25 miles for women and will be run on the indoor track.

Points Toward Grade	Time			
	Under 30	30-39	40-49	50 plus
0	>14:00	>14:30	>15:15	>16:15
6	14:00*	14:30*	15:15*	16:15*
7	13:30	14:00	14:45	15:45
8	12:30	13:00	14:00	15:00
9	11:30	12:00	13:00	14:00
10	10:00	11:00	12:00	13:00

*Minimum standard

4. Body Composition Analysis

Every student's weight and percent fat will be measured and recorded at the beginning of the semester in the Human Performance Laboratory. Females 30% and above and males 20% and above and students who experience a weight change of more than 8 pounds will be reevaluated for percent fat at the end of the semester. The formula used to predict percent fat is the International formula using 4 skinfolds. The standards are based upon this formula. For persons over the age of 29, 1% fat is added to the standard for each 10 years.

Points Towards Grade	Percent Fat	
	Men	Women
0	>26%	>36%
6	26%*	36%*
7	24%	34%
8	22%	32%
9	20%	30%
10	18%	28%

*Minimum standard

5. Attendance

The student will be expected to participate in all class activities and earn at least some aerobic points weekly unless medically or administratively excused.

Absences	Points Added To Or Subtracted From Total
0	+ 5
1	0
2	0
3	5
4	10
5	15
6*	20

*Minimum standard

Required Textbooks

Cundiff, David and Paul Brynteson. Health Fitness: Guide to a Lifestyle. Kendall/Hunt Publishers, 1979.

Cooper, Kenneth. The Aerobics Way. Bantam Press, 1977.

Discussion Units, Reading Assignments, and Laboratory Exercises

WEEK I: Medical Assessment

Format: The students will report to class (AC 114). The instructor will give the students an overview of the Medical Assessment and take the students to the Student Health Services Office.

Purpose: The purpose of the Medical Assessment is to evaluate each student's current health and fitness level as well as determine potential health problems which may develop as a result of past problems or life-style patterns. This assessment provides an excellent opportunity for the prescription of an individualized health and fitness program.

Procedure: The Medical Assessment consists of 2 phases. Phase I of the Medical Assessment must be completed before the student engages in the exercise portion of the course. It will be administered during class time and will include: family health history, personal health history, diet and smoking history, resting blood pressure and ECG, physician's heart-lung examination and body composition analysis. On the basis of phase I, the student will be (1) cleared for ORU's standard aerobic program, (2) prescribed a modified aerobics program, or (3) referred for further testing.

Phase II of the Medical Assessment is voluntary and will be scheduled individually during the rest of the semester and will include blood tests and the graded exercise test.

Phase I of the Medical Assessment must be completed by the end of the 4th week to pass the course.

WEEK II: Influence of Life-style on Health and Fitness

Purpose: The purpose of this unit is to introduce the concept of the influence of life-style on health and fitness and thus to develop an appreciation for the role and value of physical education at Oral Roberts University.

Performance Objectives:

1. Describe some of the games we play with our health.
2. List several life-style changes which have occurred since the late 1800's.
3. List several statistics that are indicative of our need to improve our life-styles.
4. Discuss the role of physical education in changing life-styles.
5. Describe several positive indicators that persons are beginning to develop a more healthful life-style.

Assigned Readings: Cundiff and Brynteson, Chapter 1

WEEK III: Concept of Health Fitness

Purpose: The purpose of this chapter is to present the concept of health fitness and to differentiate between health fitness related to health and well-being from physical performance related primarily to athletic ability.

Performance Objectives:

1. List factors related to health fitness.
2. Distinguish between health fitness related to health and well-being and physical performance related primarily to athletic ability.
3. Identify health fitness capacities.
4. Distinguish between motor ability and skill or task-specific physical performance.
5. Give an example of how each area of health fitness and physical performance can be measured or evaluated.

Laboratory Exercise: The student will take a variety of tests to further reinforce the concept of health fitness and motor ability.

Assigned Reading: Cundiff and Brynteson, Chapter 2

WEEK IV: Cardiorespiratory System I

Purpose: The purpose of this unit is to explain the function and structure of the heart to the student and describe the pathway of blood through the heart.

Performance Objectives:

1. Identify the three major structural and functional components of the cardiorespiratory system.
2. Describe the process of pulmonary ventilation, including breathing, lung volumes, and diffusion.
3. Identify or define the terms: diaphragm, tidal volume, oxygen intake, and partial pressure.
4. Describe the process of transportation including blood circulation and structure of arteries and veins.
5. Define hemoglobin, deoxygenated blood, and oxygenated blood.
6. Describe how the heart works including the structure of the heart, cardiac cycle, blood pressure, coronary blood flow, and conduction system of the heart.
7. Describe the adjustments the cardiorespiratory system makes as a response to exercise.
8. Define and explain aerobic capacity.
9. Differentiate between aerobic and anaerobic activities.

Laboratory Exercise: Warm-up exercises are explained, demonstrated, and practiced. Proper jogging form is also described and samples of good shoes are shown (141).

Assigned Reading:
Cundiff and Brynteson, Chapter 3, 14-1.

WEEK V: Cardiorespiratory Fitness II

Purpose: The purpose of this unit is to identify the factors that increase one's risk of developing cardiorespiratory diseases (CRD) and suggest life-style changes that would lower one's risk of developing these insidious diseases.

Performance Objectives:

1. List factors that increase risk of developing CRD.

2. Discuss influence of risk factors on biological mechanisms related to the atherogenic process.

3. Define the following terms: atheroma, atherogenesis, atherosclerosis, arteriosclerosis, coronary artery disease, stroke, thrombus, occlusion, etc.

4. Indicate the prevalence of CRD risk factors in children.

5. Describe the theories related to the prevention of CRD, e.g., lipid, fibrin, and collateral circulation.

6. What life-style modifications are essential for optimal cardio-respiratory health fitness?

Laboratory Exercises: Exercise by Heart rate (14-2).

Assigned Reading: Cundiff and Brynteson, Chapter 4, 14-2.

WEEK VI: Cardiorespiratory System III

Purpose: The purpose of this unit is to present basic guidelines for the development of a health fitness life-style for the cardio-respiratory system.

Performance Objectives:

1. Describe the principles of specificity, overload, progression, use and disuse, and warm-up, activity, and cool down.

2. Write a personal exercise prescription for a physical activity program that develops cardiorespiratory fitness.

3. Describe the benefits of a habitual physical activity program on the cardiorespiratory system.

4. Identify seven reasons why jogging is an excellent physical activity.

5. Describe eight practical considerations in jogging.

Laboratory Exercises: Jog-walk 1 mile at 70% (14-3).

Assigned Reading: Cundiff and Brynteson, Chapter 5, 14-3.

WEEK VII: Cardiorespiratory System IV

Purpose: The purpose of this unit is to describe the concept of aerobics as well as the implementation of an aerobics program so the student can implement his/her own personal aerobics program and earn valid aerobics points.

Performance Objectives:

1. Become acquainted with the founder of the aerobics concept -- Dr. Kenneth Cooper.

2. Explain why the field test is a good test of cardio-respiratory fitness.

3. Describe the physiological basis of the aerobics point system.

4. Explain why some activities receive more aerobics points than others.

5. Identify the amount of physical activity as measured by aerobics points needed each week to be in "good" cardio-respiratory fitness.

6. Identify what one's progression should be in terms of aerobics points.

7. Prescribe a personal aerobics program including field test and aerobics point goals.

Laboratory Exercises: Jog-walk 2 miles at 70% (14-4).

Assigned Reading: Cundiff and Brynteson, Chapter 6, 14-4.

WEEK VIII: Test I

A written test will be administered followed by a 3 mile jogwalk at 60% intensity.

WEEK IX: Nutrition - Food Analysis I

Purpose: The purpose of this unit is to provide basic nutritional information necessary for establishing the health and physical fitness life-style.

Performance Objectives:

1. Review the basic structure and function of the digestive system.

2. List the basic food sources and their role in supplying needed energy and the building blocks for cells.

3. Discuss the vitamins and minerals that are necessary for proper metabolic function.

4. Define the term Calorie and energy needs of various groups at different ages and activity levels.

Laboratory Exercise: Jog-walk 2 miles in a predicted time (145).

Assigned Reading:
Cundiff and Brynteson: Chapter 7, 14-5.

WEEK X: Nutrition - Weight Control II

Purpose: The purpose of this unit is to provide an overview of the weight control problem in our society and to discuss proper methods of attaining and/or maintaining lifelong desirable body composition.

Performance Objectives:

1. Review the weight control problem and its causes.

2. Discuss the basic factors in balancing Calorie intake with Calorie expenditure.

3. List the important considerations which should be examined when designing a health fitness life-style for lifelong maintenance of desirable body composition.

4. Recommend life-style guidelines for effective weight control.

Laboratory Exercises: Swim conditioning (14-7), the ORU swim proficiency test as outlined below, plus the calorie project (14-12).

Swim Proficiency Test:

1. Swim 25 yards on front
2. Swim 25 yards on back
3. Tread water 2 minutes

If you have a valid lifesaving card or a higher level, show the card to your instructor and this will meet the swimming proficiency requirement.

All testing will take place in the deep end of the pool. ORU requires every student to pass this test in order to graduate from ORU. If you attempt the test and fail, or know that you cannot pass it, you must enroll in Beginning Swimming HPE 026* and pass the test before you complete your sophomore year.

Assigned Reading: Cundiff and Brynteson, Chapter 8, 14-7, 14-12.

WEEK XI: Musculoskeletal Fitness I

Purpose: The purpose of this unit is to present basic information on the structure and function of the musculoskeletal system so that the student will understand and appreciate why one must develop a life-style to maintain and improve health fitness.

Performance Objectives:

1. Identify the axial and appendicular skeleton and name its major bones.
2. Describe the four functions of bones.
3. List the three physical characteristics of movable joints.
4. Differentiate among the three types of muscles.
5. Demonstrate the two types of muscular contractions.
6. Describe the factors that cause a muscular contraction.
7. Define muscular strength, muscular endurance, and flexibility.
8. List the factors that affect strength, muscular endurance, and flexibility.

Laboratory Exercise: Calisthenics (14-9) and interval training (14-6) are demonstrated and practiced.

Assigned Readings:
Cundiff and Brynteson, Chapter 9, 14-9, 14-6.

WEEK XII: Musculoskeletal Fitness II

Purpose: The purpose of this unit is to present basic information on methods for developing fitness of the musculoskeletal system so that the reader will select an appropriate health-fitness life-style.

Performance Objectives

1. Describe tests to assess the health fitness of the musculoskeletal system.
2. Describe the difference between isotonic and isometric conditioning.
3. Differentiate between strength and muscular endurance programs.
4. Differentiate between musculoskeletal programs for men and women.

5. Identify and perform calisthenics that exercise various muscle groups.

6. Identify and perform exercises with weights that exercise various muscle groups.

7. Describe the difference between static and dynamic stretching.

8. Identify and perform stretching exercises that increase the flexibility of various joints.

9. Describe the factors that contribute to low back pain.

10. Identify and perform various exercises to prevent low back problems.

11. Design a health-fitness program for the development and maintenance of fitness of the musculoskeletal system.

Laboratory Exercises: Weight training (14-11) and isometric (14-10) exercises are demonstrated and practiced.

Assigned Reading:
Cundiff and Brynteson, Chapter 10, 14-11, 14-10

WEEK XIII: Injury Prevention and Treatment

Purpose: The purpose of this unit is to describe the preventive measures one should follow before participating in and while engaging in a physical activity program as well as the basic treatment of an injury.

Performance Objectives:

As a result of reading this chapter, the reader should be able to:

1. Describe how following the principles of conditioning will not only result in improved health fitness but also serve as a guideline for prevention of injuries.

2. List 10 basic exercise injuries, their causes, prevention, and treatment.

3. Discuss the process of ice treatment for injuries.

4. Describe environmental conditions which influence an exercise program.

Laboratory Exercises: Run the ORU field test for a grade. See the course Syllabus for standards.

Assigned Readings: Cundiff and Brynteson, Chapter 11.

WEEK XIV: Test II

The second written test will be given which covers all materials since Test I. The calorie project (1412) is due at the beginning of the class period. Students will also be reweighted while they are taking the written test. Following the test, the laboratory project will be cycling and rope skipping.

APPENDIX B

KNOWLEDGE TEST

HEALTH FITNESS I

Test 1 50 Points

MULTIPLE CHOICE

1. Deaths from cardiovascular-related disease account for _____ percent of all deaths in the United States.
   a. 34
   b. 44
   c. 54
   d. 64

2. The longevity of a 45 year old man today is _____ years longer than his counterpart in 1900.
   a. 0
   b. 2 to 3
   c. 5 to 6
   d. 7 to 10

3. The first college physical education program at Amherst College in the 1860's was conducted by a
   a. basketball coach
   b. teacher trained as a physical educator
   c. medical doctor
   d. president of the college

4. A recent Gallup Poll indicated that the number of persons engaged in exercise programs for fitness purposes increased from 24% in 1961 to _____ in 1977.
   a. 29%
   b. 38%
   c. 47%
   d. 62%

5. Components of fitness which were defined as being essential to health and well-being were collectively called
   a. motor ability
   b. aerobic capacity
   c. health fitness
   d. performance fitness

6. Motor ability items include all but
   a. speed
   b. power
   c. muscle strength
   d. balance

7. The most widely accepted to determine the condition of the cardiorespiratory system is
   a. resting ECG
   b. blood pressure
   c. maximal oxygen uptake
   d. resting heart rate

8. The three general factors that significantly influence our health are all the following except
   a. heredity
   b. environment
   c. family
   d. life-style

9. The number of push-ups a person can do is a measure of
   a. strength
   b. muscle endurance
   c. flexibility
   d. agility

10. In aerobic exercise
   a. the O_2 consumed during the activity is enough to meet the O_2 requirement of the activity
   b. the O_2 consume during the activity is less than the O_2 requirement of the activity
   c. more O_2 is consumed during activity than is required, and this excess is stored for later use
   d. most of the energy is derived from the breakdown of glycogen to lactic acid

11. The best single indicator of CR (cardiorespiratory) fitness is
   a. oxygen debt
   b. aerobic exercise
   c. Kg of body weight
   d. aerobic capacity

12. A large person requires more oxygen than a smaller one because
   a. he can run faster
   b. he has more active tissue to supply
   c. he tends to accumulate O_2 debt faster
   d. he can tolerate O_2 debt for a longer period of time

13. Which of the following would be the best example of an anaerobic activity?
   a. swimming
   b. sprinting
   c. walking
   d. jogging

14. A term which means "without oxygen" or "not requiring oxygen" is
   a. aerobic
   b. anaerobic
   c. isometric
   d. isotonic

15. Oxygen intake at rest is about
   a. 250 500 ml
   b. 1000 1500 ml
   c. 2000 2500 ml
   d. 3000 3500 ml

16. What muscles do the coronary arteries supply?
    a. the lungs
    b. the abdominals
    c. the heart
    d. the brain

17. At rest, the heart normally beats an average of
    a. 40 60 bpm
    b. 80 100 bpm
    c. 30 50 bpm
    d. 60 80 bpm

18. The function of the left ventricle is
    a. send O_2 poor blood to the lungs
    b. send O_2 rich blood from the lungs to body
    c. receive O_2 poor blood from the body
    d. send O_2 rich blood to the body

19. Standard coronary risk factors include all but
    a. obesity
    b. elevates cholesterol
    c. family history
    d. poor strength

20. Hardening of the arteries is termed
    a. arteriosclerosis
    b. thrombosis
    c. atheroma
    d. clotting

21. Lack of oxygen to the brain due to a clot or buildup of placque in the arteries of the brain is called
    a. myocardial infarction
    b. fatty acid
    c. stroke
    d. coronary

22. All of the following are risk factors related to heart disease except
    a. heredity
    b. low blood pressure
    c. obesity
    d. sedentary living

23. Nicotine causes
    a. decrease in blood sugar
    b. increase in heart rate
    c. a decrease in blood fat
    d. decrease in blood pressure

24. Risk factors related to CAD for which we need medical assistance to control include all the following except
    a. diabetes
    b. obesity
    c. hyperlipidemia
    d. hypertension

25. It is recommended that in order to develop and maintain aerobic fitness, one must exercise at least _____ days per week.
    a. 1
    b. 2
    c. 3 or 4
    d. 6 or 7

26. Jogging is probably the best aerobic activity because
    a. facilities and equipment cost is minimal
    b. it results in the greatest cardiorespiratory benefits
    c. the time needed to jog for an aerobic benefit is much less than time for many other activities
    d. all of the above

27. Probably one of the greatest benefits of an aerobic exercise program is that during maximal stressful exercise
    a. more oxygen can be delivered to the cells
    b. more weight is lost
    c. greater strength results
    d. greater flexibility occurs

28. The principle of conditioning which states that you must exercise a system harder than it is normally used to working in order for the system to develop is called
    a. functional fitness
    b. specificity
    c. warm-up
    d. overload

29. If one were jogging at an intensity of 80% of his/her maximum to provide a good overload to the cardiorespiratory system, the duration of the jog should be
    a. 15 minutes
    b. 30 minutes
    c. 45 minutes
    d. 60 minutes

30. Intensity and duration are elements of the principle of
    a. specificity
    b. fitness
    c. flexibility
    d. overload

31. The three parts to an exercise routine are warm-up, actual activity, and
    a. strength exercises
    b. cool down
    c. sprints
    d. flexibility exercises

32. When you choose an exercise program, the exercise program should be chosen specifically to develop the component of health fitness that you want to develop. This is called the
    a. principle of overload
    b. principle of aerobic theory
    c. principle of specificity
    d. principle of physical fitness

33. An aerobic exercise program will probably cause all of the following except
    a. lower the resting heart rate
    b. change hereditary-genetic abnormalities
    c. lower blood fats
    d. increase aerobic capacity

34. What do we usually use to quantify intensity?
    a. maximum oxygen intake
    b. blood pressure
    c. heart rate
    d. duration

35. When a person is in very good physical condition, while resting, his heart
    a. pumps faster
    b. pumps less blood per beat
    c. rests longer between beats
    d. rests shorter between beats

36. To jog a mile between 8:00 and 10:00 minutes will give one _____ aerobic points.
    a. 2
    b. 4
    c. 6
    d. 8

37. Aerobic exercises are designed especially to develop
    a. muscular strength
    b. cardiorespiratory fitness
    c. flexibility
    d. speed

38. Performance on Cooper's Field Test is an indication of one's
    a. strength
    b. speed
    c. cardiorespiratory fitness
    d. power

39. The faster one can run Cooper's Field Test, the greater one's
    a. aerobic capacity
    b. blood fat levels
    c. resting heart rate
    d. none of the above

40. Which of the following would best describe an aerobic point?
    a. intensity x duration
    b. overload x intensity
    c. minutes x duration
    d. specificity x intensity

41. Infectious diseases are on the increase and degenerative diseases are decreasing.

42. Research studies conducted during World War II, the Korean War, and the Vietnam conflict reveal that American men have increased their physical fitness levels.

93. The guiding principle should be "develop health fitness to participate --don't expect sports participation to develop health fitness."

44. Stroke volume is the amount of blood expelled by the heart in one beat.

45. The systole is the period of the phase of the heart's pumping cycle when the ventricles are contracting.

46. Carbon monoxide combines with hemoglobin faster than oxygen and consequently reduces O_2 carrying capacity of blood.

47. Nicotine has a depressant effect on the body systems.

48. The field test is a test of speed, not aerobic capacity.

49. The slower the recorded time on the field test, the lower the aerobic capacity, which indicates a lower level of cardiorespiratory fitness.

50. Golf and jumping rope are comparable activities for obtaining aerobic points.

HEALTH FITNESS II

Test II 50 Points

MULTIPLE CHOICE

1. Which of the following meat products is highest in cholesterol?
   a. beef
   b. chicken
   c. fish
   d. fowl

2. Which is not an example of a high fat food?
   a. ice milk
   b. butter
   c. pork
   d. eggs

3. Food(s) to emphasize in one's diet are(is)
   a. refined sugars
   b. foods high in fat
   c. raw vegetables
   d. convenience foods

4. Which food nutrient is our main source of energy?
   a. proteins
   b. fats
   c. carbohydrates
   d. minerals

5. Fiber in your diet is important and comes primarily from
   a. eggs
   b. fish
   c. whole grain breads
   d. dairy products

6. Which is the most accurate method of determining percent body fat?
   a. skinfold measurement
   b. stepping on the bathroom scales
   c. underwater weighing
   d. insurance charts

7. One pound of fat is equal to
   a. 2000 calories
   b. 2500 calories
   c. 3500 calories
   d. 5000 calories

8. If a person's daily caloric intake was 1000 calories greater than his daily caloric output, how many pounds would he gain per week?
   a. 1
   b. 2
   c. 3
   d. 4

9. Overfat refers to:
   a. being overweight
   b. having a percent fat value of more than 15% for males
   c. having fat in excess of average (normal)
   d. none of the above

10. When jogging 1 mile, you will burn approximately _____ calories.
   a. 25
   b. 100
   c. 500
   d. 1000

11. A health problem not associated with obesity is
   a. hypertension
   b. cancer
   c. heart disease
   d. diabetes

12. The strongest muscles of the body are
   a. biceps
   b. triceps
   c. quadriceps
   d. hamstring

13. The anatomical structures responsible for holding bones to bones are
   a. tendons
   b. cartilage
   c. mitochondria
   d. ligaments

14. All of the following are functions of bones except
   a. red blood cells are produced in them
   b. they provide the mechanical levers for movement
   c. they function to metabolize fats
   d. they serve as protective covering for vital organs

15. A muscular contraction where the force generated by the muscle is greater than the extrinsic force on the bone is called a _____ contraction.
   a. isometric
   b. concentric
   c. eccentric
   d. lometric

16. Factors that affect strength include all the following except
    a. size of the muscle fiber
    b. adrenalin
    c. number of muscle fibers contracting
    d. flexibility

17. To improve strength, a muscle group should be exercised
    a. once a week
    b. three times a week
    c. six times a week
    d. seven times a week

18. 10 RM means
    a. 10 repetitions per minute
    b. being able to lift 10 pounds under your maximum 10 times
    c. the maximum amount of weight that can be lifted 10 times
    d. lifting 10 pounds as many times as possible

19. Lifting weight through the full range of motion to gain muscular strength is classified as an
    a. isometric exercise
    b. isotonic exercise
    c. aerobic exercise
    d. a and c

20. Preventing low back pain includes all <u>except</u>
    a. sleeping on one's stomach
    b. exercising abdominal muscles
    c. using leg muscles when lifting heavy objects
    d. keeping hamstring muscles flexible

21. Hypertrophy of muscle tissue means
    a. an increase of muscle tissue
    b. changing muscle into fat
    c. decomposition of muscle tissue
    d. increased muscle coordination

22. If you did not have access to a Universal Gym or other weight-lifting equipment and wanted to strengthen the chest and triceps you could
    a. do pull-ups
    b. do push-ups
    c. do lat pulls
    d. a and b

23. For strengthening the shoulders, chest and triceps with the use of a Universal Gym or weights, one should perform
    a. the bench press
    b. lat pulls
    c. arm curls
    d. none of the above

24. Besides sit-ups, another exercise that strengthens one's abdominal muscles is
    a. leg raises
    b. lateral pulls
    c. military press
    d. knee flexion

25. Two exercises to overload the quadriceps are
    a. military press and leg press
    b. leg raises, bent knee sit-up
    c. bench press, knee extension
    d. knee extension and leg press

26. When performing isotonic strengthening exercises with weights, which of the following is not recommended?
    a. slow, controlled movements
    b. movements performed to full range of motion
    c. in order to lift heavier weights, do not use full range of motion
    d. perform workouts every other day

27. Lack of flexibility in which of the following muscle groups is directly related to lower back problem?
    a. abdominals
    b. quadriceps
    c. hamstrings
    d. deltoids

28. Why should one avoid the use of a nylon or rubber suit when running?
    a. causes muscle strains
    b. raises core body temperature
    c. causes muscle cramps
    d. causes shin splints

29. A sprain is an injury to
    a. a ligament
    b. a tendon
    c. a muscle fiber
    d. a bone

30. Side ache is probably caused by
    a. overstretching
    b. salt deficiency
    c. blow to a muscle
    d. insufficient oxygen supply to the diaphragm muscle

31. The immediate treatment for a sprain is
    a. rest and buy shoes with good arch support
    b. ice for 15-20 minutes
    c. heat until swelling has stopped
    d. stretch it out

32. The purpose of ice treatment includes all the following except
    a. reduces swelling
    b. decreases bleeding in the area
    c. dilates blood vessels
    d. quickens healing

33. Shin splints are a type of
    a. sprain
    b. joint injury
    c. muscle strain
    d. muscle cramp

34. Warming up helps prevent injuries since at higher body temperatures
    a. the O_2 exchange from blood to tissues is slower
    b. nerve impulses travel slower
    c. lower viscus resistance in muscles
    d. greater resistance to blood flow in muscles

35. Symptoms that you have exercised too hard include all the following except
    a. heart rate above 120 five minutes after the workout
    b. muscle soreness persistent 48 hours after the workout
    c. difficulty sleeping at night
    d. heavy sweating during the exercise

36. Which of the following does <u>not</u> characterize type A behavior patterns?
    a. competitiveness
    b. relaxed and mellow
    c. time urgency
    d. overcommitment to vocation

37. Which religious group emphasizes a life-style of diet and exercise?
    a. Mormons
    b. Catholics
    c. Methodists
    d. Episcopalians

38. When a person is in a stressful situation, all of the following occur except
    a. decreased blood pressure
    b. increased heart beat irregularities
    c. increased blood fats
    d. increased blood sugar

TRUE - FALSE Answer <u>A</u> for True, <u>B</u> for False

39. Egg whites are a good source of protein.

40. When one has to fry foods, vegetable oil would be a poor choice of oil.

41. Saturated fats tend to increase the amount of cholesterol in the blood.

42. A proper diet can reduce the chances of a heart attack.

43. The ideal percent fat value for men has been set at 20-25%.

44. Through exercise one can change his/her body composition from fatty deposits to lean body tissue.

45. In order to maintain body weight, one's caloric intake must be equal to his/her energy expenditure.

46. Body composition can change with little or no change in body weight.

47. All things being considered, isometric exercises are considered of greater benefit than isotonic.

48. The most effective exercises to develop muscle strength are stretching exercises.

49. When stretching, one should jerk and bounce in order to produce maximum stretching.

50. Physical exercise is considered by many experts as one of the best preventative and restorative measures in dealing with psychological stress.

APPENDIX C

ATTITUDE TEST

MacPHERSON-YAHUSZ ATTITUDE TO EXERCISE AND PHYSICAL ACTIVITY QUESTIONNAIRE

1. Physical exercise is beneficial to the human body.
2. Exercise helps to work off emotional tensions and anxieties.
3. Adults get all the phycial activity they need in their daily work.
4. Exercise is of little value in maintaining desirable body weight.
5. Regular physical activity makes one feel better.
6. Physical education should be a required subject for elementary and secondary school children.
7. Exercise does more harm than good.
8. Those who are physically able should take part in a daily period of physical activity.
9. An individual has all the strength and stamina he needs without participating in a programme of exercise.
10. Exercise does little to improve a person's sense of well-being.
11. Heavy physical exercise makes an individual muscle bound.
12. When recovering from a cold, it is best if one does not engage in physical activity.
13. Participating in physical activity aids mental relaxation.
14. Exercise is important in aiding a person to gain and maintain all-round good health.
15. The heart cannot be strengthened by exercise.
16. A person's leisure time should be spent in rest and relaxation.

17. Individual sports such as tennis are more satisfying to play than team games.

18. I think exercise is good for me.

19. You should seek help from a qualified physical educator before you undertake strenuous exercise.

20. Regular exercise decreases one's desire to smoke.

21. A person in good physical condition is better able to endure nervous stress.

22. Exercising with a group leads to improved social relationships.

23. Exercise becomes less necessary as one advances in age.

24. A woman can improve her poise and posture by regular participation in physical activity.

25. Regular physical activity has a beneficial effect on an individual's ability to carry out his job responsibilities.

26. Exercise gets rid of harmful feelings and emotions such as anger and hostility.

27. Those who are physically healthy do not need to engage in physical exercise.

28. Anyone over 25 years of age should avoid exercise because he might strain his heart.

29. Regular participation in physical activity makes one look better.

30. It is better to have never exercised at all than to have exercised and stopped immediately.

31. It is annoying that we have to waste our time exercising.

32. A period of exercise gives a lasting feeling of well-being.

33. Exercise is of no real value in improving one's health.

34. Those who are physically able should engage in a weekly session on physical activity.

35. Muscles, when not used, turn to fat.

36. Exercise is valuable in building up an adequate reserve of strength and stamina for everyday living.

37. Regular exercise does not relieve constipation.

38. If I exercised, I would rather do it by myself.

39. Girls should not exercise strenously because they will become muscular.

40. Physical exercise is less important today than it was in my parent's time.

41. Exercise increases one's appetite.

42. When one reaches full physical growth exercise is no longer necessary.

43. Physical activity in some form is an excellent remedy for the tense irritable and anxious person.

44. Regular physical activity makes a man more alert.

45. Regular physical activity has little effect on one's personality.

46. A person in good physical condition is less likely to have solds.

47. Regular physical activity will help me live longer.

48. Working up a good sweat helps to get rid of body poisons.

49. Wehn a person improves his physical condition he improves his work productivity.

50. Physical activity can help in preventing major medical diseases.

ATTITUDE TOWARD EXERCISE AND PHYSICAL ACTIVITY

ANSWER SHEET

NAME: _____ DATE: _____

.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	( )	( )	( )	( )	( )	26.	( )	( )	( )	( )	( )
2.	( )	( )	( )	( )	( )	27.	( )	( )	( )	( )	( )
3.	( )	( )	( )	( )	( )	28.	( )	( )	( )	( )	( )
4.	( )	( )	( )	( )	( )	29.	( )	( )	( )	( )	( )
5.	( )	( )	( )	( )	( )	30.	( )	( )	( )	( )	( )
6.	( )	( )	( )	( )	( )	31.	( )	( )	( )	( )	( )
7.	( )	( )	( )	( )	( )	32.	( )	( )	( )	( )	( )
8.	( )	( )	( )	( )	( )	33.	( )	( )	( )	( )	( )
9.	( )	( )	( )	( )	( )	34.	( )	( )	( )	( )	( )
10.	( )	( )	( )	( )	( )	35.	( )	( )	( )	( )	( )
11.	( )	( )	( )	( )	( )	36.	( )	( )	( )	( )	( )
12.	( )	( )	( )	( )	( )	37.	( )	( )	( )	( )	( )
13.	( )	( )	( )	( )	( )	38.	( )	( )	( )	( )	( )
14.	( )	( )	( )	( )	( )	39.	( )	( )	( )	( )	( )
15.	( )	( )	( )	( )	( )	40.	( )	( )	( )	( )	( )
16.	( )	( )	( )	( )	( )	41.	( )	( )	( )	( )	( )
17.	( )	( )	( )	( )	( )	42.	( )	( )	( )	( )	( )
18.	( )	( )	( )	( )	( )	43.	( )	( )	( )	( )	( )
19.	( )	( )	( )	( )	( )	44.	( )	( )	( )	( )	( )
20.	( )	( )	( )	( )	( )	45.	( )	( )	( )	( )	( )
21.	( )	( )	( )	( )	( )	46.	( )	( )	( )	( )	( )
22.	( )	( )	( )	( )	( )	47.	( )	( )	( )	( )	( )
23.	( )	( )	( )	( )	( )	48.	( )	( )	( )	( )	( )
24.	( )	( )	( )	( )	( )	49.	( )	( )	( )	( )	( )
25.	( )	( )	( )	( )	( )	50.	( )	( )	( )	( )	( )

VITA[2]

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