AN EVALUATION OF THE EFFECTIVENESS OF A SELF-INSTRUCTIONAL VIDEOTAPE IN MUSIC EDUCATION

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ABSTRACT

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An Evaluation of the Effectiveness of a Self-Instructional Videotape in Music Education

The produced videotaped programme on the nature of pitch in music is one of a series of ten projected programmes which deal with the fundamental elements of music.

This experiment was conducted to determine if the use of student-regulated videotaped instruction could be used as an efficient, self-contained learning system for the cognitive, affective, and psycho-motor domains in music education.

Secondary school students were told about the experiment and thirty volunteers were chosen on the basis of their low scores on pre-tests designed to measure each volunteer's entering musical knowledge and education. Each subject individually viewed the eighteen-minute videotaped programme without an instructor present. When finished, he completed a post-test.

The hypotheses that subjects would both enjoy the programme and learn in cognitive and psycho-motor domains were confirmed. These results support the increased use of videotaped instruction in music education.

ACKNOWLEDGEMENTS

Many educators state that the need for institutions which impose boundaries on when, where and how to obtain information should be removed. They feel that there is a valid need for global indices to information and people who can guide a child towards his own interests and objectives. Student participation and involvement, decentralization of information, easy access to information, and immediate feedback to the student for self-evaluation is given top priority. This project studies the significance of using a videotaped lesson in learning situations in the light of these needs. Although the use of videotape has just recently been used to teach performance skills, this study is innovative in that it attempts to teach the basic elements of music appreciation in the cognitive, affective and psycho-motor domains.

This thesis-equivalent spans many areas of specialized information. The interdisciplinary nature of the study would have made the thesis-equivalent very difficult to undertake without the help of experts in

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CONTENTS

CHAPTER V.

LIST OF TABLES

LIST OF ILLUSTRATIONS

CHAPTER I

INTRODUCTION

The enormous influence of radio, films, telephones, magazines, books, recordings and television on today's student has produced a new learner as well as new kinds of media for learning. The learner has access to a wide spectrum of information sources and a high value must be placed upon the learner's motivation and continued interest, as he has many subjects and sources to choose from. Since this new learner is more exposed to and familiar with visual information, it may be necessary to place more weight upon visually-mediated learning than was necessary in a verbally-oriented society.

Audio-visual learning resources are emerging to meet other educational challenges as well. For instance, television is seen as an aid in overcoming the problem of teacher shortage and improving the quality of teaching a specialization. In 1966 the National Center for School and College Television reported, "More and more administrators are turning to television in an

effort to reach large numbers of students with too few teachers and to bolster the quality of a school system's music instruction."[1]

A major problem of secondary schools, however, is that of inflexible class schedules. Present indications are that televised instruction for secondary school students will remain only an occasional form of teaching until school buildings are equipped with videotape players which will permit one to replay the tape at will.

SELF-INSTRUCTION AND VIDEOTAPE

Numerous advantages should accrue when using a student-operated videotape unit with a self-instructional programme. One method begins with the student choosing the programme he is interested in by reading the summary

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[1]The National Center for School and College Television, "Institutional TV in Music Education, Supplement #1," Morse Communication Research Center, Waltham, Mass.: Brandeis University, 1966, XXV, 5.

of the content matter of the programme. He can be given his entering capability score for comparison purposes with his terminal capability score. This allows immediate feedback and self-evaluation. The student can play back sections he is unsure of. He can advance in the mode "fast forward" to the sections he is interested in by means of an accurate indexing system. The tapes are available for playing any time. Thus the student is forced to accept more responsibility for his own education. Further, it leaves any available resource persons free to guide each student individually. The programme may be structured according to degrees of complexity, allowing the student to gradually develop his capabilities. The use of videotaped lessons gives an opportunity to all students, not just those who are lucky enough to have a specialist teacher.

Theoretically, the VTR can bring the best possible instruction to its viewers. The videotape can be used by many students, offsetting the initial high cost of preparation. It is possible to provide access to remote places and events, orchestras, singers, and other

resources otherwise unavailable in the classroom. Active participation and not merely passive viewing can be stressed. For instance, the narrator may ask questions to which the students respond or there can be activities for the student to engage in along with the television instructor. Properly prepared and validated videotapes can be used as supplements, complements or as self-contained courses.

Although music is part of the traditional high school curriculum there is little indication that students have a wide choice of options within this subject area, that the student is able to direct or evaluate his learning to any extent, that there are adequate facilities to allow those students who wish to perform to do so, or that there are an adequate number of music specialists in the schools.

As a survey of the literature reveals no research on the effectiveness of self-instructional videotaped programmes in music, a novel challenge is presented. Can some of the deficiencies of secondary music education be solved by using self-instructional videotaped programmes

in the music curriculum of secondary high schools?

Within the past two decades only sixteen research studies which deal directly with televised music education have been identified. As there is little research on the effectiveness of learning music via self-instructional videotaped programmes, I will cite instances where television and film have been found effective in other learning situations in North America. This is not to say that self-instructional videotape units do not have characteristics which are unique to specific learning situations. Due to the lack of research at this point, however, I will have to draw inferences from research in closely-related areas.

EFFECTIVENESS OF MEDIATED INSTRUCTION

Film: Research on its Effectiveness as a Tool in Learning

Hoban[2] classifies results of some 400 investigations on learning from films into three zones of certainty: low, intermediate, and high. The four criteria for high certainty were (1) intuitively reasonable, (2) reported by a competent and constructively imaginative investigator, (3) related to some systematic formulation, and (4) the investigation should have been replicated. The conclusions which met Hoban's criteria were: (1) people learn from films, (2) learning from films varies in amount with audience characteristics, such as age and formal education, and (3) the amount of learning can be increased by using one or more of the following tested mechanisms and methods: (a) redundancy, (b) participation, (c) attention-directing

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[2]C. F. Hoban, "The Usable Residue of Educational Film Research," W. Schramm (ed.), New Teaching Aids for the American Classroom, (Stanford: Institute for Communication Research, 1960), 95, 115, 550.

devices and methods.

This cumulative study justifies the use of redundancy, student participation and attention-directing devices and methods in the script (see Appendix 4).

Television: Research on its Effectiveness as a Tool in Learning

Carpenter[3] performed a comprehensive study on the use of television (local, cable and national) in music education in the United States. The telecasts reached approximately one-half million of the student population. Carpenter's data, like other similar studies, however, were based mainly upon teachers' opinions, specialists' subjective conclusions and students' feelings. Other sources of evaluation included the personal interaction of the studio teacher

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[3] T. H. Carpenter, "Utilization of Instructional Television in Music Education," 1969, Contract OEC-2-6-058306-1292, Study Project No. 5-8306, note especially the successful instruction using classroom TV to teach music in Philadelphia, Baltimore, Washington, D.C., Delaware and Anaheim, California. ED 032-788, 345-354.

with the classroom teacher, quizzes given by classroom teachers throughout the year, written exams given and graded by the television staff at the end of each semester and feedback sheets included in each teacher's guide. The latter methods were not used in all cases where television was used to teach music.

The evaluations studied the clarity of objectives per lesson, the effectiveness of visuals and camera work, the adequacy of directions and explanations, the amount of material or concepts presented in each lesson, the attitude of the class towards the televised lessons, the quality of reception and the effectiveness of the teacher's guide. In some schools, an in-school television committee for each grade level provided collective reaction to the general effectiveness of the programmes.

Telecasts were used to serve various functions. For example, Alabama used television as in-service guidance, Alburquerque used it as a supplement to regular review and reinforcement, while Anaheim used it to evaluate specialists. Denver used television to enrich, supplement and reinforce classroom teaching.

Despite such varied intentions, Carpenter concluded that television was highly effective in the teaching of music on a mass scale. This research, however, did not study the possibilities of television as a medium for individualized instruction.

Even when television was seen as deficient, it was not considered deficient in quality because of the limitations inherent within the medium itself. Rather, defects were attributed to the "lack of imagination, boldness and talent in the people using it."[4]

De Bernardis and Ernst claim to have achieved excellent results when using colour slides and recordings in teaching music.

> Almost without exception, the audience expressed genuine pleasure from the experience. Teachers were invariably amazed at the power of the combination of still pictures and music in holding the sustained attention of a class for 20 minutes.[5]

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[4]Judith Murphy and Ronald Gross, Learning by Television (New York: Ford Foundation and the Fund for the Advancement of Education, Office of Reports, August, 1966), XXVIII, 86.

[5]A. De Bernardis and E. Ernst, "Pictures and Music," XXXVIII, NEA Journal, Nov. 1949, 616.

Vasil and Gillespie[6] concluded that the use of non-book instructional materials is an effective means of improving music education. Vasil considered that any excessive use of one medium to the exclusion of others is as inadvisable as is the perpetuation of teacher-oriented seminar or lecture presentation as the sole means of creating learning environments. Finally, a multi-media approach was considered to have its greatest value in allowing for a sufficient variety of presentation in order to provide adequately for individual differences in learners.

The National Center for School and College TV Conference[7] assessed the adequacy of television use in contemporary music education. The material and information was made available by seventy-five ETV stations. It

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[6]T. Vasil and D. R. Gillespie, Jr., "Project for the Improvement of Music Education at the Elementary, Junior High, Senior High and College Levels Through the Use of Nonbook Instructional Media," OE-HEW #062131, Contract No. OEC 1-6-062131-1356, 1968. ED 030-301, 28.

[7]The National Center, Ibid.

was concluded that -

> Properly used, TV in music education can be a major classroom resource to initiate instruction, a complementary resource to reinforce the classroom teacher's presentation or an enrichment to extend the range of content and to broaden the student's experiences. It can also play a meaningful part in in-service and pre-service teacher-education.

In summary, it has been proven that television and film can be used effectively for learning purposes. More studies, however, are needed to accurately assess the types of music as well as learning and teaching techniques which are more meaningful and appropriate to the various ages and background levels of students in order to effectively increase the capabilities of the learner.

CHAPTER II

MUSIC INSTRUCTION

Current Curriculum Objectives

Little agreement appears to exist between people holding different positions in education as to the specific roles and objectives of music education. Jones[1] and Kelley[2] substantiated this finding when they conducted research on the opinions of superintendents, principals and music teachers. Further, Freeman[3] and

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[1]Donald W. Jones, "A Comparative Study of Selected Issues in Music Education as Represented in the Opinions of Principals, Music Teachers and Professors of Music Education," Doctoral dissertation, Ohio State U., 1961, cited in The Encyclopedia of Educational Research, 4th ed., R.L. Ebel (ed.) (Toronto: Collier-MacMillan Canada, 1969), 898.

[2]William L. Kelley, "Beliefs and Practices of Administrators and Musicians from Selected Midwestern Cities Concerning the Importance and Functions of Music in the Public Schools," Dissertation, U. Kansas, 1962, cited in Ibid.

[3]Warren S. Freeman, "A Study and Evaluation of the Current Status of Music Education Activities in the Public Schools of the United States," Dissertation, Boston U., 1955, Ibid.

Ernst[4] found that there was slight relationship between MENC recommendations and school practices.

There is a lack of substantive content and curriculum offerings in the more academic aspects of music. And although general music is the most frequently scheduled musical activity in the junior high school, there are no specific common objectives as such.

The common curriculum patterns include choral singing, band and general music. Keegan[5] reported that music educators believe that music classes should include singing and listening activities, rhythmic and instrumental experience, and music readings. Hollingsworth,[6]

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[4]Karl D. Ernst, "A Study of Certain Practices in Music Education in School Systems in Cities Over 150,000 Population," Dissertation, U. Oregon, 1955, Ibid.

[5]Arthur J. Keegan, "A Study of Music in General Education and a Manual for Teaching General Music in the Lower Secondary Grades," Dissertation, New York U., 1956, as found in Dissertation Abstracts, Parts 1 and 2, XVI, 1464.

[6]Beverly J. Hollingsworth, "A Survey of the Status of the General Music Program in the Junior High Schools of Texas," Master's thesis, U. Texas, 1953, cited in Educational Research, 899.

Mueller,[7] and Peterson[8] found that the most frequent activities are unison and part-singing, listening and the study of music fundamentals. All of these activities, as commonly structured, lack freedom of choice, individualized instruction, student participation, individualized pacing and immediate feedback since they take place in the classroom with all the other students.

Instructional Objectives

When learning takes place, the change in the learner may be intentional or unintentional. Two different kinds of objectives can be aimed for:

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[7]Paul R. Mueller, "The Status of the Junior High General Music Class in California," Master's thesis, Fresno State College, 1960, cited in Ibid.

[8]Ruth D. Peterson, "An Investigation of Academic Music Courses in the Public Secondary Schools of Missouri," Master's thesis, Northeast Missouri State College, 1962, cited in Ibid.

expressive or behavioural. Expressive objectives differ considerably from behavioural objectives.

> An expressive objective does not specify the behaviour the student is to acquire after having engaged in one or more learning activities. An expressive objective describes an educational encounter. It identifies a situation in which children are to work, a problem with which they are to cope, or a task in which they are to engage. But it does not specify what they are to learn after having engaged in an encounter, situation, problem or task. In the expressive context, the product is as likely to be as much of a surprise to the maker as it is for the teacher who encounters it.[9]

Behavioural objectives, on the other hand, deal with the measurable and the observable. Mager identifies three components necessary to specify a behavioural objective: the behavioural performance, the condition under which this performance will be observed and the criteria for acceptable performance.[10]

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[9] E. W. Eisner, "Instructional and Expressive Educational Objectives: Their Formulation and Use in Curriculum," AERA Monograph Series on Curriculum Evaluation #3, Instructional Objectives, R. E. Stake (ed.) (Chicago, Illinois: Rand, McNally and Co., 1969), 15-16.

[10] Robert F. Mager, Preparing Instructional Objectives (California: Fearon, 1962), 12.

Expressive objectives are relevant to the learning of music, as music understanding is not always measurable or observable. Due to the necessity of judging the effectiveness of the videotaped music lesson within a short period of time, however, it is imperative that behavioural objectives, in the pre- and post-test, are used to accurately measure the success of the programme. To help compensate somewhat for the lack of expressive objectives, a few questions based on the "open-ended" format were included. Students' comments to these open-ended questions can be found in Figure 1.[11]

Behavioural Music Objectives

More and more interest has been expressed in being able to measure the effectiveness of music instruction. In 1971, for instance, the Tanglewood Symposium participants urged the specification of "measurable areas of musical achievement and the simul-

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[11] See Page 117.

taneous development of criteria for assessing such musical behaviours."[12]

Musical growth can be seen to bring about behavioural changes in six general areas. As described by Hughes,[13] the student first learns musical knowledge. The student learns to identify and define symbols and terms. Factual knowledge is important only when it contributes to musical understanding and responsiveness. The student next develops musical understanding. Musical understanding includes recognition of and insight into the constituent elements of music (melody, texture, rhythm and form), and the expressive elements of timbre, tempo and dynamics. Thirdly, the student achieves certain musical skills such as those of listening, performance and reading. These performance and reading skills properly grow from an understanding which develops

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[12]Miriam B. Kapfer, "Behavioural Objectives in Music Education," Educational Technology, XI, #8, August 7, 1971, 30.

[13]W. O. Hughes, Planning for Junior High School General Music (Belmont, Cal.: Wadworth Publishing Co., 1971), 17-21.

through aural skills. These aural skills should precede the understanding of notation and the development of reading skills. Fourthly, the student develops music appreciation and taste. Implied here are personal value judgments and discrimination based on cultivated sensibility and educated choices. Fifthly, the student develops constructive attitudes which imply the acceptance of music as a healthy and positive force in human lives. Desired attitudes must be cultivated by means of musical activities. Students must learn to accept their limitations, be willing to explore new music and respect the abilities and preferences of others. Finally, musical habits which reveal themselves in musical initiative, independence and discrimination evolve. Thus, skills, insights, tastes, attitudes in action, initiative and independence are the behavioural objectives to be attained in teaching music.

LEARNING IN MUSIC

Cognitive Domain

Formerly the major objective of musical aptitude tests was to measure the degree of native musical ability. Scores earned on musical aptitude tests are currently considered to be only one source of data - intelligence and extra-musical facts such as interest and motivation, parental encouragement, cultural background and physical coordination may be of equal importance, say most authorities.

Although there is a lack of agreement on behavioural traits which would define the basic abilities in music, Whybrew[14] attempted to state some of the traits which are most common to traditional western musical understanding: (1) perception of small differences in pitch, (2) recognition and retention of melodies and chords, (3) interval discrimination, and (4) perception of specific pitches in chords.

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[14]William E. Whybrew, Measurement and Evaluation in Music (Brown, 1962), 90.

Gaston[15] gave emphasis to perceptual ability in organizing sounds. Some musical tests emphasize sensory capacity while others emphasize perceptual response. Both of these are explored on the programme. The music itself is explored and the explanation of the fundamental musical concepts is delved into. Duerksen[16] found that the ability of high school students to recognize repeated and altered musical themes does not appear to be related to participation in music performance activities, but to listening experiences. He showed that many years of participation in performance, or composition, or analysis are necessary before an appreciable increase in recognition ability becomes evident. Due to the age of the viewer, musical listening experience and comprehension were stressed rather than the instruction

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[15]E. Thayer Gaston, "A Study of the Trends of Attitudes Towards Music in School Children with a Study of the Methods Used by High School Students in Sight-Reading Music," Dissertation, U. Kansas, 1940, cited in Educational Research, Ibid.

[16]George L. Duerksen, "Recognition of Repeated and Altered Thematic Materials in Music," Doctoral Dissertation, U. Kansas, 1967, Abstracts, XXVIII, 2709-A - 2710-A.

of an instrument, or singing skills.

Teaching children to read musical notation has been and continues to be a major problem in music education. Hutton[17] found that the use of special visual materials along with the more traditional techniques slightly improved music reading ability. This is why visuals were used to teach the notation. Nelson[18, 19] found that the use of instruments in the elementary school classroom enhances achievement in music reading. Thus, instruments were placed in the learning carrel so that if the viewer wished to experiment with the sounds of these instruments (which were the same instruments used by the TV instructor), he had access to them.

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[17]Doris Hutton, "A Comparative Study of Two Methods of Teaching Sight Singing in the Fourth Grades," Journal of Research in Music Education, I, 1953, 119-26.

[18]Carl B. Nelson, "An Experimental Evaluation of Two Methods of Teaching Music in the Fourth and Fifth Grades," Dissertation, U.Minnesota, 1954, Abstracts, XIV, 1232.

[19]Nelson, "A Follow-up of an Experimental Teaching Method in Music at the Fourth and Fifth Grade Levels," Journal of Experimental Education, XXXIV, June 1956, 283-9.

Further, the TV instructor makes specific references to the instruments found in the carrel to encourage the viewer to participate in the lesson.

The development of music listening skills (aural perception and discrimination) appears to be enhanced when children are trained to master pitches given vocally or from the piano (Petzold,[20] Wolner and Pyle[21]). Thus, in the videotaped presentation, the piano was used to demonstrate pitch, and the narrator also sang to demonstrate tones at various pitches.

Petzold[22] found that skill in aural perception can be developed only if the child is able to hear the item before he sings it, and that accurate reading is more likely to result when greater emphasis is placed

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[20]Robert G. Petzold, "The Perception of Music Symbols in Music Reading by Normal Children and by Children Gifted Musically," Experimental Education, XXVIII(IV), 1960, 271-319.

[21]M. Wolner and W. H. Pyle, "An Experiment in Individual Training of Pitch-Deficient Children," Journal of Educational Psychology, XXIV, 1933, 602-8.

[22]Petzold, "The Development of Auditory Perception of Musical Sounds by Children in the First Six Grades," Journal of Research in Music Education, XI(I), 1963, 21-43.

upon understanding the significance of the notation rather than upon a mere "imitation" of musical sounds. Thus, it would seem important that self-instructional programmes should emphasize comprehension and listening skills rather than merely repetition of sound.

One method of developing a student's musical understanding is through listening experiences which encourage the student to distinguish between small differences in pitch, to recognize and retain melodies and chords, and to perceive certain pitches in chords. Visuals, the piano, and singing may increase learning efficiency. All of these can be readily included in a videotaped educational programme.

Affective Domain

The musical taste of high school students (Rubins,[23] Rogers,[24] and Bauman[25]) does not seem to be affected by the amount and/or types of musical experiences in the schools. Musical taste, as Farnsworth[26] has suggested, appears to be folkway which develops through social conditioning. Erneston[27] reported that college

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[23]Louis Rubins, "The Effects of Music Experience on Musical Discrimination and Musical Preferences," Dissertation, U. California, 1952, cited in Educational Research, Ibid., 901.

[24]Vincent R. Rogers, "Children's Expressed Musical Preferences at Selected Grade Levels," Dissertation, Syracuse U., 1956, Abstracts, XVI, 1917-1918.

[25]Victor H. Bauman, "Socio-Economic Status and the Music Preferences of Teen-Agers," Dissertation, U. Southern California, 1958, cited in Educational Research, Ibid.

[26]Paul R. Farnsworth, The Social Psychology of Music (New York: The Dryden Press, 1958), 144-146.

[27]Nicholas Erneston, "A Study to Determine the Effect of Musical Experiences and Mental Ability on the Formation of Musical Taste," Dissertation, Florida State U., 1961, cited in Educational Research, Ibid., 902.

students with more experience in music appear to have a higher level of acquired taste in music. Little is known about effective methods of teaching music appreciation to high school students. Getz,[28] however, found that two or three repetitions of composition were necessary after the introduction before familiarity and preferences were affected. Thus, various types of music should be played and some repeated. Further, as drums are a part of the youth culture, and an important biological gateway, a drummer should make a programme more relevant to the viewer.

Socio-economic status, age and sex (Fisher,[29] and Bauman[30]) do not appear to be significant variables in music preference or taste.

Social conditioning and repetition of composition play a major part in the attitudes developed by the

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[28]Russell P. Getz, "The Influence of Familiarity Through Determining Optimum Responses of Seventh Grade Children to Certain Types of Serious Music," Dissertation, Penn. State U., 1963, cited in Educational Research, Ibid.

[29]Rhoda L. Fisher, "Preference of Different Age and Socio-Economic Groups in Unstructured Musical Situations," Journal of Social Psychology, XXXIII, 1951, 147-52.

[30]Bauman, Ibid.

student towards music.

Swanson[31] found that adolescent boys during the "change of voice" period appeared to gain more theoretical knowledge of music and to improve more in singing when placed in a class by themselves. This factor may influence the results of the post-test and may increase the differences on the scores between male and female.

Ausubel[32] found that the average adolescent is in the last stages of growth in motor and mechanical development. Fine motor and mechanical abilities, however, lag behind that of the wrist, elbow and shoulder, in that order. The major accomplishments of adolescence are the development of adult capacities in physical and physiological functions.

There seems to be little difference in mechanical ability due to sex under conditions of relatively

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[31] F. Swanson, "Voice Mutation in the Adolescent Male: An Experiment in Guiding the Voice Development of Adolescent Boys in General Music Classes," Dissertation, U. Wisconsin, 1959, in Abstracts, XX, 2718.

[32] D. P. Ausubel, Theory and Problems of Adolescent Development (New York: Grune and Stratton, 1954), 122.

equal opportunity for practice. In fact, Ausubel[33] finds that in everyday mechanical skills, the relative superiority is almost completely a function of differential opportunity for practice. So theoretically, both males and females have the same mechanical ability potential. The temporary "change of voice" period may affect the scores between males and females and give the females an edge in reproducing sounds.

Adolescents of thirteen to fourteen years of age have developed adult psycho-motor capacities and, theoretically have minimal limitations on their learning capabilities. Further research is needed to accurately describe the specific learning capabilities at different ages, and devise methods to effectively teach music appreciation and self-instructional techniques in music understanding and performance.

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[33] Ausubel, 124.

PRODUCTION GUIDELINES[34]

Short Learning Units

In the general music class at the junior high school level, Zima[35] and Weigand[36] have reported that the organization of activities and materials into broad units of instruction produced a higher level of effective learning and teaching. The videotaped programme is therefore divided up into units of information, beginning on a simple level and progressing to the more complex.

It has been found that it is far more efficient to learn any skill in numerous short sessions than to

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[34]The guidelines followed for the produced videotaped programme were also used in the conceptual development of the series as found in Chapter IV.

[35]Barbara H. Zima, "A Comparative Study of Two Approaches to the Teaching of Required Music Classes in the Junior High School," Master's thesis, Northwestern U., 1956, cited in Educational Research, Ibid.

[36]James J. Weigand, "A Comparison of the Effectiveness of Two Methods of Teaching General Music in the Junior High School," Empire State College Research Studies, X(III), 1962, 5-55.

learn the same thing in a few long sessions. This rationale supports the concept of an eighteen-minute videotape with several segments, instead of longer-playing ones or longer units.

Sequencing Information

Although learning has been conceived of by some as an atomistic response to a single stimulus, it may also be seen as a total or holistic response to a complex situation. The students must see the whole that they are studying while giving careful attention to the parts. This Gestalt approach to learning is developed by Mursell,[37] who argues that "the various items that need to be presented do not occur once and for all at some pre-determined time. They appear again and again always in new settings, always with added meaning." The

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[37] J. L. Mursell, "Growth Processes in Music Education," The National Society for the Study of Education: Basic Concepts in Music Education, N. B. Henry (ed.), 57th Yearbook, Part 1, (Chicago: University of Chicago Press, 1958), 162.

clue to sequencing information is not in emphasizing the accumulation of knowledge, but in guiding students so that, through repeated experiences dealing with concepts, they discover increasingly precise interrelationships within the conceptual structure.

Leonhard[38] and Mursell[39] found that learning, in music, is more effective when musical experiences precede the learning of musical symbols. Time signatures are neither basic nor fundamental to musical understanding; emphasis should be placed on the fundamentals of pulse and meter. The studio instructor, therefore, plays the piano to illustrate music symbols rather than merely verbally explaining their functions.

Further, unfamiliar selections in class sessions must offer opportunities for transfer and extension of the musical learnings already experienced. Here the key to sequencing lies in choosing materials which

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[38]C. Leonhard, "Evaluation in Music Education," The National Society, Ibid., 322.

[39]Mursell, Music Education Principles and Programs (Morristown, N.J.: Silver Burdett Co., 1956), 71.

illuminate the interrelatedness of all musical elements.

Repetition, developing more precise understandings, stressing musical experience more than verbal comprehension, and interrelating information are major tenets when sequencing information.

Self-Instruction

In 1958 the National Society for the Study of Education described what it considers to be essential elements of a successful learning situation for all subject matters. "If an individual is expected to strive toward a given level of success, the goal involved must be meaningful to him and must be within his reach." This suggests that the musical goals must be relevant to the learner's context and that the learning steps be paced according to the individual's own learning speed. The NSSE elaborated further: "The subject matter, teaching methods, musical materials and facilities must fit the student's maturity and

background."[40] The Society, in defining its position concerning reward-learning and definitive-learning steps, concluded, "It is only within a limited area of difficulty where either success or failure are possible outcomes that music pupils logically can be said to be ego-involved (motivated)."[41] These findings led to the decision to produce a videotaped programme providing for small information units, simply-stated information, repetition, student participation, immediate feedback after every response, and individually-paced learning.

The self-instructional system must stimulate intellectual excitement. In order to attract the viewer, participation can be highly encouraged by having the narrator ask questions, pause and then offer the right answer. Musical instruments in the learning carrel would allow the student to participate along with the narrator. There is no teacher as the student views the programme, thus the student controls the learning pace.

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[40] Louis P. Thorpe, "Learning Theory and Music Teaching," The National Society, Ibid., 167.

[41] Robert House, "Curriculum Construction in Music Education," Ibid., 236.

He can even turn off the programme if he so chooses. The student should thus be encouraged to choose, direct, correct, review and evaluate his own progress.

The instruction itself can follow a pattern. The subject matter may be taught by pattern, by interrelationship, by structure, by generalization, by synthesis and by transfer, to reinforce any learning that was taking place. The justification for this approach was explained by Bruner.[42] To make the learning as easy as possible for positive reinforcement, Bruner's general suggestions are paraphrased: music before concepts, concepts before labels and skills, ear before eye, experience before recognition and recognition before drill.

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[42] Jerome Bruner, The Process of Education (New York: Vintage Books, 1960), 31-32.

THE NATURE OF PITCH IN MUSIC

Mursell[43] suggested learning is a process which begins with a compelling problem and proceeds towards its solution by the apprehension, classification and application of meaning. Such a problem-solving approach was utilized in the programme produced - The Nature of Pitch.[44] First, information was given, a problem suggested (its solution needing an understanding of the information previously given) and then the right answer was given with clarification. Thus, a learning situation was set up.

The series of programmes is developmental but each programme will be integral in itself: that is, each programme builds on the preceding programme but each programme is a whole in itself. To demonstrate that it is possible to produce one programme out of a

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[43] Mursell, Ibid.

[44] The Nature of Pitch is fifth in a series of ten programmes. The series is outlined in Chapter IV.

series that is integral in itself, the programme on pitch, which was the fifth programme in the series of ten, was produced. Although the programme makes references to information dealt with in other programmes, the student is still able to fully comprehend the information dealing with pitch itself. Since musical understanding depends upon cyclical learning, units of information are repeated within the programme as a type of review. All of the units of information are integrated into one overall theme, that of pitch.

The survey of the literature on music education justifies the use of repetition, elaboration, and practical application when structuring the sequence of information. Activities such as singing, listening, instrumental experiences and reading notation were also presented, since there seems to be some general consensus that these activities are important.

CHAPTER III

NOTES FOR THE DISTRIBUTOR

Videotaped Programmes on Music Appreciation

Programme 4: The Nature of Pitch in Music*

These tapes are to be stored in the library. Pre-tests and post-tests are available in the library for the student's self-evaluation. Instruments for each programme can be found in the Department of Music and should be placed in the carrel for the student's use. A Review Sheet is available also in the library. This Review Sheet is to be given to the student after the completion of the lesson.

A music instructor is assigned to the student to help him complete Sections C of the Pre-Test (see Appendix 1, Section C) and of the Post-Test (see Appendix 2, Section C). Both Sections C will take three minutes each to complete.

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*See Appendix 4.

After the lesson, the student is to report to the instructor for a discussion of the tape and for suggestions for further studies (see Bibliography in Chapter 4). Instead of a discussion between the student and the instructor, a study group could be organized each week for a discussion on each lesson. A short exam is to be written after the fifth lesson and after the tenth lesson so that the instructor can evaluate the strengths and weaknesses of the tapes and of the student.

If the tapes are not effective for certain students, other methods of instruction should be used. If the student wishes to pursue this area of study further, the instructor can guide him to other videotaped programmes in the Music Series, to elementary performance groups or to general music classes.

Intended Audience

The population consists of students at the secondary educational level, aged thirteen to fourteen,

male and female, in Grade Eight, of average IQ (i.e., not retarded), and from a socio-economic cross-section. The students are assumed to have had little previous formal training in musical skills or music appreciation. As with most adolescents, they can be expected to have had heavy exposure to popular music on radio, TV, and film. The boys' voices may be breaking and this factor may affect their psycho-motor skills in reproducing sounds.

NOTES FOR THE STUDENT

This videotaped programme deals with the nature of pitch in traditional western music. It does not teach how to play an instrument. It does teach how to appreciate music by listening. The programme lasts for eighteen minutes and is part of a ten-programme series on the fundamental elements of music.[1]

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[1]See Chapter IV.

1) First, read the outline of the programme.[2]

2) Still interested? Then fill in the pre-test,[3] asking the instructor to help you with Section C. If you do not know at least three-fifths of the answers in each section,

3) Then watch the videotape[4] and review the sections that are unclear.

4) Fill in the post-test,[5] and compare your results with the pre-test score.

5) Ask for the Review Sheet from the Distributor.[6]

Please hand in any suggestions you have which might improve the programme. Thanks.

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[2]See Pages 40, 41 and 42.

[3]See Appendix 1.

[4]See Appendix 4.

[5]See Appendix 2.

[6]See Page 44.

Description of Programme 5: The Nature of Pitch

This videotaped lesson deals with the nature of pitch in music. Pitch denotes the highness or lowness of a note. The earliest methods of indicating pitch were more suggestive than specific. Early music was learned by heart, but in early Catholic church music, signs called neumes were used to give the general direction of sound. These neumes were placed about the words of the sounds in order to aid in memorizing the tone. Later, they were spaced higher or lower to give some idea of how high or how low each pitch was to be. As this notation by heightened neumes became more complex, one or more lines were drawn through the neumes to indicate certain fixed pitches. After experimentation with staves of four to seven lines, a five line staff became standard by the Seventeenth Century and this is the staff universally used in tonal music today. Staves are combined in keyboard and ensemble music. After 1945,

spatial notation such as curves, squiggles and jagged peaks, and so on are used to denote the relative pitch of each sound to another sound. This lesson, however, deals with tonal western music whose pitch is described by the traditional notational signs.

Aims of the Programme

The aims of the programme are:

1) To introduce the concept of the full importance of pitch in music by means of the listening musical experience;

2) To demonstrate the factors which influence the nature of pitch;

3) To introduce the student to a basic music vocabulary centered around the function of pitch in music;

4) To acquaint the student with differing pitches

among notes of different instruments;

5) To instruct the student how to precisely note down the pitch of a note.

Content of the Programme

The programme on pitch contains the following elements in the following sequences:

A musical excerpt is played twice, first beginning at Middle C and then beginning at High C. This exercise is used to compare the difference in pitch each time the excerpt is played. Pitch in music is shown to be an important aspect of music appreciation. The operational and acoustical aspects of pitch are demonstrated by the use of an oscilloscope. The distinction between perfect pitch and relative pitch are demonstrated with the use of a piano. The oscilloscope is used to demonstrate the differing vibrations produced by different instruments playing the same pitch. The reason for the development of pitch notation and the

description of its growth, towards more precise ways of notating pitch is narrated. Finally, the student is shown a few basic pitch symbols which are used to define precisely the pitch of different notes in traditional (i.e., not electronic) music.

The following words are introduced and either explained verbally, or where possible, shown visually or demonstrated acoustically: pitch, vibration, sound wave, timbre, staves, sharps, flats, perfect pitch, relative pitch, treble clef, bass clef, neumes, oscilloscope, semi-tone and monochord.

Several different instruments are used by the narrator to demonstrate various musical concepts. Instruments included are piano, drums, glass bottles, a xylophone, a monochord and a horn.

After having studied the videotape, the student should be able to demonstrate that the aims of the programme have been achieved (see Page 41).

Review Sheet for Lesson 5: The Nature of Pitch

This sheet is to be used for review purposes after you have finished Lesson 5.

1) Pitch - (acoustics) The word used to indicate the relative highness or lowness of a tone. It is scientifically determined by the number of vibrations per second.

2) Vibration - (acoustics) A complete sound wave moving to point of highest displacement through the point of lowest displacement and back to point of highest displacement.

3) Amplitude - (acoustics) The difference between the high and the low phases of a sound wave or sound cycle. Usually expressed in pressure as it affects the ear drum. The amplitude determines the loudness of a sound.

4) Sound Wave - (acoustics) The continuation of a sound vibration through an adjacent medium such as air.

5) Staff - A series of horizontal equi-distant

lines, now invariably five in number, upon which the musical notes are written.

6) Sharp - The notation placed before the head of a note which acts to raise the pitch of the note a semi-tone.

7) Flats - The symbol placed before the head of a note which acts to lower the pitch of the note a semi-tone.

8) Perfect Pitch - The ability to reproduce a sound at a specified pitch without any given pitch reference.

9) Monochord - A scientific instrument which is composed of a sound box over which is stretched a single string. By means of a moveable bridge or a group of moveable bridges, the string may be divided at any one point.

10) Musical Sound - A sound is characterized by a definite pitch, intensity and quality. They are produced through vibrating strings, vibrating air columns and vibrating rods, reeds, plates and membranes.

11) Oscilloscope - (acoustics) A machine which

can produce a visual image of a sound wave.

12) Music Appreciation - The ability to describe and emotionally understand the elements which define music.

13) Musical Notation - The symbols with which music is written.

CHAPTER IV

OUTLINE FOR THE SERIES OF PROGRAMMES ON MUSIC APPRECIATION

Programme 1: Silence/Noise/Music

This programme deals with the similar and dissimilar characteristics of silence, noise and music.

Sequencing of Information

The narrator gives an overview of the content in the series and appropriate methods for learning. The objectives of this particular programme are then outlined.

The concept of "silence" is defined as "no sound." Tapes of street noises (motorcycles and cars), electronic noise (white noise, radio static), animal noises (horses, chickens, call of the white whale), space sounds (airplanes), and sounds of people are played. After each sound, the narrator asks the viewer to identify the sound. The sound is then played again and synchronized with identifying slides. "Sound" is defined as a property of an elastic object. The elastic object,

emitting a vibration which may be processed so as to be seen on an oscilloscope, visually demonstrates the concept of "sound." Audiotapes are used to demonstrate sounds produced by three musical instruments: piano, horn and violin. After each tape, the narrator asks the viewer to identify the instrument which produced the sound. After a pause the narrator states the answer. The narrator asks the viewer to write down three distinctions between silence, noise and music. The narrator then demonstrates how silence and noise can be used in music, as illustrated by a musical excerpt played by an in-studio group. The narrator concludes that silence and noise can only be used to make music when these elements are deliberately used by the composer. When these sounds occur randomly, they are not music in the sense of traditional western art and religious music.

The narrator summarizes the programme and refers the student to a review sheet on which the answers to unanswered questions will be found.

Vocabulary

The terms: silence, noise, music, sound waves,

oscilloscope, and vibration are explained with the visual aids of title graphics, pictoral graphics, and musical excerpts played on the piano.

Behavioural Objectives

After having viewed the lesson, the student will be able to define the terms listed in the vocabulary and to compare silence, noise, and music by demonstrating on nearby objects in the study carrel (e.g., a rap on the desk, breathing, the ring of a tuning fork).

Programme 2: Notes

This programme deals with the musical properties and notational symbols of "notes."

Sequencing of Information

The narrator states the objectives of the programme and briefly reviews the first lesson.

The narrator begins the programme by playing a musical excerpt. The viewer is then asked what the musical excerpt consists of. The excerpt is then played

again, this time very slowly; the camera has a closeup shot of the narrator's hands playing the piece one note at a time. The narrator then states that each sound is written on a "staff" as a "note." Title graphics are used to indicate correct spelling of these terms. The musical properties of a note (note head, note stem, and note flag) are verbally described and musically illustrated with the musical excerpt played previously. Title graphics indicate the correct spelling of each new term. The notation of the musical properties of a note (duration: dots, ties, slurs, and rests; pitch: key signature, sharps, staff, flats, accidentals; and loudness: phrasing and grouping accents) are keyed onto the screen as the narrator demonstrates each new term on the keyboard.

The narrator summarizes the lesson and refers the student to a review sheet.

Vocabulary

The terms: note, duration, pitch, loudness, note head, note stem, note flag, dots, ties, slurs, rests, key signature, staff, flats, accidentals, phrasing, and grouping accents are defined with the use of title

graphics, pictoral graphics and demonstrations on the piano.

Behavioural Objectives

After viewing the lesson, the student will be able to define and illustrate the terms listed in the vocabulary. The student will be able to state the three musical properties of a note. The student will be able to define and draw the notation of each of the musical properties of a note.

Programme 3: Scales #1

This programme studies the relative major and minor scales in music and their musical notational symbols.

Sequencing of Information

The narrator states the objectives of this programme and briefly reviews the first two programmes.

The narrator plays musical excerpts on the piano from Bach, the Beach Boys and the Beatles which are basically elaborations of major and minor scales. The

instructor asks the student if there are any similarities among the selections. After a pause, the instructor plays just the scales which form the foundation of each selection. The narrator verbally explains the similarity and then visually demonstrates the difference between the major and minor scales on the piano. A "live" note (animation, marionettes, or an actor) jumps on the appropriate key for a major scale and then for a minor scale on an enlarged keyboard. The narrator plays excerpts from traditional and popular music and asks the student to write in his notebook whether a minor scale or a major scale forms the foundation of each musical theme played. After a pause, the narrator gives the answer. The narrator discusses in detail the notational symbols for the scales with the use of graphics keyed in at the appropriate times. The narrator then replays the themes and the appropriate notational symbols for the major and then the minor scale.

The narrator summarizes the points made on the show and refers the student to a review sheet.

Vocabulary

The terms: staff, scale, sharp, flat, relative scale, minor scale, and major scale are verbally defined and visually illustrated with title graphics, pictoral graphics and demonstrations on the piano.

Behavioural Objectives

After viewing the lesson, the student will be able to define the terms listed in the vocabulary, write the note notation for major and minor scales on a staff, be able to distinguish between a minor and major scale when each is played on the piano and also be able to say whether a minor or major scale forms the musical foundation of a musical piece played.

Programme 4: Scales #2

This programme studies the nature and notational symbols of chromatic scales in music.

Sequencing of Information

The narrator states the objectives of the

programme and briefly reviews the themes of the previous programmes.

The narrator plays on the piano musical excerpts from a classical and then from a modern composer which emphasize chromatic musical scales. The narrator asks the student to write down any similarities between the two pieces. After a pause, the narrator plays just the scales which form the basis of each musical theme. The narrator then defines the term "chromatic," using the piano to demonstrate the meaning. (The notational symbols are described in detail with the aid of graphics.) A "live" note (animation, marionette, or an actor) jumps on the appropriate key on an enlarged keyboard for the chromatic scale. Excerpts from traditional and popular music are played and the student is asked to answer in his notebook, which scale forms the foundation of the musical theme played; after a pause, the narrator answers the question. The appropriate notational symbols are keyed in as the narrator again plays a chromatic and then an enharmonic scale.

The narrator summarizes the points made on the

programme and refers the student to a review sheet.

Vocabulary

The terms: chromatic scale, note, sharp, flat, accidental, and staff are defined with the aid of title graphics, pictoral graphics and demonstrations on a piano.

Behavioural Objectives

After viewing the lesson, the student will be able to define the terms found in the vocabulary. He will be able to write a chromatic scale on a staff. The student will be able to state if a chromatic scale forms the foundation of a musical piece played.

Programme 5: The Nature of Pitch in Music

This programme is described previously (see Page 40). Validation of its objectives will be found in Chapter V. The shooting script will be found in Appendix 4.

Programme 6: Rhythm

This programme studies different patterns of rhythm and rhythm notation.

Sequencing of Information

The narrator explains the objectives of this lesson and briefly reviews the previous lessons.

The narrator plays a musical excerpt and defines rhythm using the excerpt as a basis of explanation. A drum is used to demonstrate different kinds of rhythms. First, a musical excerpt consisting of a regular pattern is played. Then a musical excerpt consisting of irregular patterns of beat is played. The narrator asks the student to jot down on a piece of paper the difference between the two excerpts. Then the narrator verbally explains the difference. The student is asked to play a musical piece on the desk with a regular pattern of beats. Then, the student is asked to play a musical piece on the desk with irregular patterns of beats. The notation symbols for rhythm (barlines, meter and measure) are keyed in as the narrator demonstrates their meaning on

the piano. A metronome's function is explained verbally, visually and musically. A metronome is used to keep the beat.

The narrator summarizes the points made on the programme and refers the student to the review sheet.

Vocabulary

The terms: rhythm, beat, syncopation, barline, meter, measure, metronome, duple beat, triple beat, accented note and unaccented note are verbally defined with the visual aids of title graphics, pictoral graphics and demonstrations on the piano.

Behavioural Objectives

The student, after viewing the lesson, will be able to: define the terms in the vocabulary; clap different beats with his hands after the beats have been clapped on screen; distinguish between a regular pattern of beats and an irregular pattern of beats; draw a meter, a time signature, a rest; use a metronome to indicate a half note to be played at 120; and clap four beats to the metronome count.

Programme 7: Timbre

This programme studies the dimensions of timbre in different instruments and voice.

Sequencing of Information

The narrator introduces the programme by stating the objectives to be met and briefly reviewing the previous lessons.

The narrator plays a musical excerpt several times, using a different instrument each time he plays the same excerpt. An oscilloscope is used to illustrate the different timbre of both different and identical instruments and voices. A monochord is used to describe a fundamental, which is also pictorally illustrated. Similarly, a harmonic partial is illustrated. The dimensions of tone colour (range limit from the lowest to the highest tone) and dynamic limit (the degree of softness or loudness of the tone) is explained, using different-shaped bottles and wind instruments to illustrate variables. The student is asked to experiment with different instruments (different-sized bottles) made

available in the carrel in order to produce sound with different tone colour (e.g., two types of harmonicas or two types of wooden flutes). Tapes of musical excerpts are used to demonstrate the different timbre of the same type of instrument. The student is asked to write in his notebook which instrument has the richer timbre. Tapes of voices singing will be used to demonstrate how certain voices have more timbre than others.

The narrator summarizes the objectives of the programme and refers the student to the review sheet.

Vocabulary

The terms: timbre, harmonic partial, range limit, dynamic limit, pure tone, overtones, and tuning fork are verbally defined and visually illustrated with title graphics, and pictoral graphics and oscilloscope readings. They are musically illustrated with demonstrations on the piano.

Behavioural Objectives

The student, after viewing the programme, will be able to distinguish between different vibrations emitted from both different and same instruments and

voices. The student will be able to define each of the terms in the vocabulary. The student will be able to illustrate the meaning of a fundamental and a partial on a monochord. Using bottles provided in the carrel, the student will be able to illustrate the variables determining tone colour. The student will be able to distinguish between the two instruments the one with the "richer" sound.

Programme 8: Melody

This programme studies the concept of melody in music as well as the affective reactions elicited by different intervals.

Sequencing of Information

The narrator opens the programme by discussing the objectives of the programme and by giving a brief summary of the previous lessons.

The narrator then begins playing an occidental music excerpt on the piano. Then a tape of oriental

music is played. The student is asked to write in his notebook the characteristics that distinguish the two pieces from one another. Common elements (notes, patterns, repetition and melody) are discussed and illustrated with title graphics and keying in pictoral graphics where possible. Using the musical excerpts, a musical interval is described by the narrator. The narrator then asks the student to write down which of the three melodic tendencies (up, down, across) is played. The narrator plays a musical piece with pitch but without rhythm and asks the student if this piece has melody. The pitch-space relationship is demonstrated with the use of the monochord. All the possible variations of the interval are demonstrated. The student is asked to note down his emotional reaction to the different intervals upon first hearing them, then again after hearing them played more than once. The implication of familiarity is discussed and the student is asked to jot down notes in his notebook.

The narrator summarizes the programme and refers the student to the review sheet.

Vocabulary

The terms: occidental, oriental, melody, interval, pitch-space relation, tones, pitch and duration will be verbally explained with the use of title graphics, pictoral graphics and demonstrations on the piano.

Behavioural Objectives

The student will be able to describe which of the three melodic tendencies is played (up, down, across), distinguish between a large interval and a small interval; describe, upon hearing a melody played, the high and low points of interest.

Programme 9: Harmony

This programme is concerned with the nature of chords in musical harmony.

Sequencing of Information

The narrator explains the objectives of this lesson and briefly reviews the previous lessons.

The narrator then plays musical excerpts played

in Programme #8. Harmony is verbally defined in terms of what it is not (using oriental music to demonstrate), and in terms of what it is (using occidental music to demonstrate). Chords are defined. Active and rest chords are introduced. The narrator demonstrates the different degrees of chords on a piano (tonic, supertonic, mediant, subdominant, dominant, submedian and octave). The occidental music is then played and the use of specific chords is pointed out. The emotional effect of different chords is discussed. The difference between consonance and dissonance chords is demonstrated and then studied. Their emotional effect as evidenced with the occidental music is discussed, using the question and answer format.

The narrator summarizes the lesson and refers the student to a review sheet.

Vocabulary

The terms: harmony, chord, triads, active chord, rest chord, the seven degrees of the chord, consonance chord, dissonance chord and counterpoint are defined and explained with the use of the piano, title graphics and

pictoral graphics.

Behavioural Objectives

The student will be able: to state the function of harmony in occidental music, to define the terms presented in the vocabulary, to state which chord is most used to resolve a musical piece, and to distinguish between a played consonance and dissonance chord on the piano.

Programme 10: Articulation

This programme concerns the different articulations used in music notation to indicate different interpretative techniques.

Sequencing of Information

The narrator begins the programme by stating the objectives of the programme and then by briefly reviewing the previous lessons.

The narrator plays a musical excerpt on the piano without phrasing and then with phrasing. The student is

asked to note down in his notebook the distinguishing factor between the two pieces. The narrator then answers his question after a pause. The student is asked to explain the difference. The narrator answers his questions after appropriate pauses and then the notation symbol is keyed in. A musical piece is played on the piano and the student is asked if there is phrasing and/or accentuation. The answer is then given. A musical piece is played without shading (crescendo, decrescendo, diminuendo, and so on). Then the same musical piece is played with shading. The student is asked to describe the difference. The appropriate answer is given and examples of notational symbols are keyed in when the narrator demonstrates on the piano. An appogiatura and a trill are played. The difference between each is explained and then the appropriate notational symbol is given. A musical piece is played twice, each time in a different mood: agitato, then amabile. The emotional reaction caused by each mood is discussed.

The narrator summarizes the lesson and refers the student to the review sheets. Options for further

studies in music are suggested.

Vocabulary

The terms: phrasing, accentuation, shading, appogiatura, trill, mood, articulation, are defined and illustrated with the use of title graphics and pictoral graphics and demonstrations on the piano.

Behavioural Objectives

The student will be able to define and illustrate any of the articulations listed in the vocabulary. The student will be able to distinguish between any two articulations when heard in a musical excerpt. The student will be able to sing melodies in different character and be able to state the appropriate articulations to achieve a sad listener, a happy listener or a bewildered listener.

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CHAPTER V

RESULTS AND DISCUSSION

Hypotheses

In order to evaluate the possible effectiveness of a self-instructional videotaped music programme in the three domains of learning, the following hypotheses were postulated:

H_1 - If general music appreciation and notational skills are presented through the use of a self-instructional videotape playback unit, the student will enjoy learning the subject matter.

H_2 - Through the use of a self-instructional ETV programme, the student will increase his knowledge of musical symbols and terms.

H_3 - Through the use of a self-instructional ETV programme, the student will increase psycho-motor skills involved in music appreciation.

Research Design

Subjects

For practical reasons the LaSalle Catholic High School in Ville LaSalle was selected for the evaluation. Students of the Eighth Grade formed the population to be sampled. Every fourth student in Grade Eight was chosen from the master list; a sample of forty students was produced. These students were invited to the school's auditorium where the procedure was introduced.

Procedure

I explained to the forty students that I was a student at Sir George Williams University and that I was completing a Master's thesis-equivalent on learning music from a videotape machine. I then demonstrated the record and playback modes of the VTR.

The students were then told that if they were interested in music and wished to view the videotaped lesson they should remain in the auditorium and those who were not interested were free to leave.

Thirty-five volunteers remained. They were

immediately given the pre-test (see Appendix 1) after the other five students left.

Those students who had taken music lessons for four years or more, or those students who answered correctly at least 60% on any section of the pre-test, were rejected for the experiment on the grounds that they knew most of the lesson's content before viewing. Five students were rejected on these grounds, leaving a sample of thirty.

During the next few days each of the thirty students was asked to come on an individual basis to the auditorium. I again demonstrated the record and playback modes of the VTR and then left the room. The student then studied the videotaped lesson alone. After he finished viewing the videotape, he came outside, received the post-test (see Appendix 2), and filled it in while in the auditorium. He then called me from outside to help him complete Section C.

Apparatus

A $\frac{1}{2}$" black and white Sony AV 3600 videotape recorder was used with an 18" monitor. A monochord, and three bottles (two the same size and one of these two

partially filled with water) were placed on a long table along with the VTR equipment. The student placed his chair where it seemed most effective to him for viewing. As the table was on the stage, lighting conditions could have been better. Although the auditorium was not soundproof, the lesson was only viewed during class periods and the halls were quiet.

After the tape had been viewed about twenty times, the definition on the tape began losing its contrast. However, the tape remained in fairly good viewing condition for all the subjects. The learning environment, however, could have been more intimate and with better lighting conditions.

The measuring instruments (pre-test and post-test) are included in Appendices 1 and 2. These were used to measure the change in learning between the pre-test and the post-test.

FORMAL BACKGROUND IN MUSIC EDUCATION

Music had never been studied in school by 73.3% of the subjects. The remaining 26.7% had studied three years or less in school (see Appendix 1, item B1).

Further, 86.7% had never studied music outside of the schools. The remaining 13.3% had studied for a year or less (see Appendix 1, item B2).

Thus, the majority of the subjects had never received formal music instruction (see also Appendix 1, item A5).

Of the twelve subjects who had studied music, 9.1% said that they liked studying this subject "immensely;" none replied "very much;" (54.5%) were relatively indifferent at "alright;" 36.4% were negative in stating that they liked studying music "not very much" (18.2%); and "not at all" (18.2%) (see Appendix 1, item A6).

HYPOTHESIS 1: AFFECTIVE DOMAIN

It was decided to operationalize this hypothesis by means of two questions:

1) Did you enjoy learning by yourself?

2) Did you enjoy using a videotape to learn about pitch?

In addition, each student was asked if he would like to learn more about music this way. It was assumed the first two questions have face validity for, and the third permits an inference about, the student's enjoyment of the self-instructional videotaped lesson on music appreciation.

The majority of subjects (63.3%) stated that they were unaccustomed to teaching themselves (see Appendix 1, item A1). To the extent that this is accurate it might have introduced a bias in the final results. A further source of possible bias is that the efficiency of those subjects who said they had taught themselves was not assessed, so nothing can be surmised about the success of either group in self-instruction.

Of those eleven subjects who said they had taught themselves, 90.9% claimed to have enjoyed learning by themselves "very much;" 9.1% enjoyed learning by themselves "alright." No one was indifferent or negative towards self-instruction. No one strongly enjoyed self-instruction (see Appendix 1, item A2).

Nine subjects said they had used television to learn about a subject such as music but it is not clear whether they meant self-instructional television or open-circuit television. Nonetheless, twenty-one subjects said they never used television to learn about a subject such as music. The majority of subjects in the experiment reported they were not familiar with using television for self-instruction in music (see Appendix 1, item A3).

Of the nine subjects who had used television to learn about a subject such as music, six (66.7%) stated they enjoyed the experience to the degree of "alright" and three (33.3%) enjoyed the experience "very much." No one enjoyed the experience "immensely," "not much" or "not at all" (see Appendix 1, item A4). These responses are illustrated graphically in Figure 1.

In the post-test, twenty students (66.7%) were strongly positive in their enjoyment of the self-instructional programme, to the degree of "immensely" (six subjects or 20%), "very much" (fourteen subjects or 46.7%), "alright" (nine subjects or 30%), and "not much" (one subject or 3.3%) (see Appendix 2, item A1). This is in contrast to the relatively indifferent pre-test responses of students who had previously taught themselves.

The pre-test and post-test responses of subjects, and the pre-test responses of those who previously had taught themselves, are illustrated in Figure 2.

On the post-test, twenty-five subjects (83.4%) were strongly in favour of using videotape to learn about pitch. Five subjects or 16.7% gave "alright" as their response. No one was moderately or strongly negative in their view of using videotape to learn about pitch (see Appendix 2, item A2). Responses of all subjects to the question, "Did you enjoy using a videotape to learn about pitch?" are illustrated in Figure 2.

In addition to statements about enjoyment of self-instruction and of using videotape to learn about

pitch, a further inference can be made about the extent to which the student enjoyed learning the subject matter using self-instructional television. The student was asked if he would like to learn more about music in this way on the post-test. It was stated by 93.3% that they would like to learn more about music in this way; 6.7% stated that they did not wish to learn more about music in this way (see Appendix 2, item A3).

Conclusion

Although many of the subjects were unaccustomed to methods of self-instruction, to videotaped instruction, and to music instruction (and although few of the subjects who had previously studied music enjoyed that experience), results permit us to infer that the students enjoyed learning the subject matter using self-instructional ETV lessons. Accordingly, we conclude that H_1 was confirmed.

HYPOTHESIS 2: COGNITIVE DOMAIN

It was decided to operationalize this hypothesis by sampling several possible cognitive outcomes, viz., the concepts of "pitch," "staff," and "bass clef." The chi-square test was selected to test for statistical significance of any difference in frequency of responses between pre-test and post-test. It was decided to reject the null hypothesis for $p < .05$.*

Definition of Pitch: The term "pitch" was defined correctly by 3.3% before viewing the lesson (see Appendix 1, item B3). After viewing the lesson, 83.3% correctly defined the term "pitch" (see Appendix 2, item B1). A chi-square test was performed on the data and the results appear in Table 1.

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*It is assumed that no actual differences exist between the observed and expected frequency of correct and incorrect answers. If the difference is equal to or greater than the critical value required for an accepted significance level for the appropriate df, the null hypothesis is rejected.

TABLE 1. DEFINITION OF "PITCH"

	Correct	Incorrect
Pre-test	1	29
Post-test	25	5

$x^2 = 35.90$

$df = 1$

$p < .001$

The null hypothesis is rejected ($p < .001$) and we can infer that due to the viewing of the videotaped programme the students increased their knowledge about pitch in music.

Concept of Pitch: Not one subject gave an acceptable description of the term "perfect pitch" on the pre-test (see Appendix 1, item B4). "Relative pitch"was correctly described by 30% on the post-test (see Appendix 2, item B4). Results of the chi-square test of differences in frequencies appear in Table 2.

TABLE 2. CONCEPT OF PITCH

	Correct	Incorrect
Pre-test	0	30
Post-test	9	21

$x^2 = 8.37$

$df = 1$

$p < .01$

The null hypothesis is rejected ($p < .01$) and we can state that due to the viewing of the videotaped programme, the students increased their knowledge about distinctions to be made in the concept of "pitch."

Staff: On the pre-test not one subject stated correctly the function of a staff in music (see Appendix 1, item B5); 60% correctly stated the function of a staff on the post-test (see Appendix 2, item B5). Results of the chi-square test appear in Table 3.

TABLE 3. THE FUNCTION OF A STAFF

	Correct	Incorrect
Pre-test	0	30
Post-test	18	12

$x^2 = 22.94$

$df = 1$

$p < .001$

The null hypothesis is rejected ($p < .001$) and we can state that due to the viewing of the videotaped programme the students increased their knowledge of the function of a staff in music.

Bass Clef: Initially 20% of the subjects could draw a bass clef (see Appendix 1, item B6). After viewing the lesson, only 23.3% could draw a bass clef (see Appendix 2, item B6). Results of the chi-square test appear in Table 4.

TABLE 4. HOW TO DRAW A BASS CLEF

	Correct	Incorrect
Pre-test	6	24
Post-test	7	23

$x^2 = 0.00$

$df = 1$

$p < .99$ (N.S.D.)

The null hypothesis cannot be rejected ($p < .99$); students did not increase their ability to draw a bass clef.

Conclusion

The majority of students increased their factual knowledge about "pitch" and "relative pitch" in music and the function of a staff. The self-instructional television programme, however, did not effectively teach the student to draw a bass clef. Nonetheless, we conclude that Hypothesis 2 has been confirmed.

HYPOTHESIS 3: PSYCHO-MOTOR DOMAIN

This hypothesis was operationalized by requiring the subject: to distinguish a pitch in both a large and a small interval; to hum a higher pitch note; and to identify a changed note in a triad.

Tone Interval: Initially 83.3% could state which note was higher in a large interval (see Appendix 1, item C1). On the post-test only 63.3% were able to distinguish the note with a higher pitch in a large interval (see Appendix 2, item C1). Thus, the self-instructional programme appears to have had a negative effect. Results of the chi-square test of significance appear in Table 5.

TABLE 5. DISTINCTION OF PITCH IN A LARGE INTERVAL

	Correct	Incorrect
Pre-test	25	5
Post-test	19	11

$x^2 = 2.13$

$df = 1$

$.15 < p < .20$

The null hypothesis cannot be rejected ($.15 < p < .20$) and we cannot conclude that due to the viewing of the videotaped programme the students increased or decreased their psycho-motor ability to distinguish between a tone of a higher and a lower pitch in a large interval.

Semi-tone Interval: Initially 43.3% could distinguish the lower note in a small interval (see Appendix 2, item C2). After viewing the videotaped lesson, 80% were able to distinguish which note was lower in pitch in a small interval (see Appendix 2, item C2). Results of the chi-square test appear in Table 6.

TABLE 6. DISTINCTION OF PITCH IN A SMALL INTERVAL

	Correct	Incorrect
Pre-test	13	17
Post-test	24	6

$x^2 = 7.05$

$df = 1$

$p < .01$

The null hypothesis is rejected ($p < .01$) and we

can infer that due to the viewing of the videotaped programme the students increased their ability to distinguish between a tone of higher and a lower pitch in an interval of a semi-tone.

Humming: Initially 46.7% could hum the higher note (see Appendix 1, item C3). On the post-test 86.7% were able to hum the higher pitch (see Appendix 2, item C3). Results of the chi-square test appear in Table 7.

TABLE 7. HUMMING THE HIGHER PITCH

	Correct	Incorrect
Pre-test	14	16
Post-test	26	4

$x^2 = 9.07$

$df = 1$

$p < .01$

The null hypothesis is rejected ($p < .01$) and we can infer that due to the viewing of the videotaped programme the students increased their ability to hum the lower pitch.

Triad: Only half of the subjects originally could distinguish between the higher or lower pitch of a changed middle note in a triad (see Appendix 1, item C4). After viewing the lesson 90% were able to distinguish between the higher or lower pitch of the changed middle note in a triad (see Appendix 2, item C4). Table 8 shows results of the chi-square test.

TABLE 8. CHANGED NOTE IN THE TRIAD

	Correct	Incorrect
Pre-test	15	15
Post-test	27	3

$x^2 = 9.60$

$df = 1$

$p < .01$

The null hypothesis is rejected ($p < .01$) and we can infer that due to the viewing of the videotaped programme the students increased their ability to distinguish the changed note in a triad.

Conclusion

Although students did not increase their ability to distinguish differences in pitch in a large interval, the students, for the most part, increased their psycho-motor ability to distinguish differences in pitch in a small interval, hum the higher note when two notes were played and distinguish the changed note in the triad. Students did not increase their ability to distinguish differences in pitch in a large interval since most of the students (83.3%) were able to distinguish these differences initially. However, it is concluded that Hypothesis 3 was confirmed.

COMMENTS MADE BY STUDENTS

There were only five negative statements:

1) "A videotape machine cannot answer a student's questions."

2) "When I went back once because I didn't

understand what he said, the word still wasn't clear."

3) "The man looked very sloppy."

4) "The fact that it finished so fast."

5) "I wanted to learn how to play the guitar."

Everyone had something positive to say about the programme. The main themes can be illustrated as follows:

1) "I can go back if I don't understand. And no one is there to get angry."

2) "The fact that it went slowly and was easy to follow and that if you didn't understand you could turn back, also because it demonstrated what they were talking about."

3) "The questions make you think more than in a class."

4) "I found I was not pushed into it and that I could take my time."

5) "I like it because you can learn by yourself and you can rewind it if you didn't understand."

6) "It was interesting and was not hard to understand."

7) "I liked playing the instruments."

8) "Learning by yourself."

9) "It is an easy way to learn music, it has the main things on the program and it's fun."

10) "You could understand it clearly, when you are alone you are concentrating on it, and you learn more that way."

11) "I liked the lesson because I didn't have a teacher over my shoulder and I could go at my own speed."

12) "I liked the way it was done. It was not too complicated and it touched most of the basics."

DISCUSSION

As a result of viewing this self-instructional videotaped lesson, the subjects not only enjoyed this approach but also were able to increase their listening skills and knowledge about music, thus confirming all three hypotheses. Additionally, students' comments (see above) may be helpful in forming an impression of this attempt to provide a self-instructional system for music.

In order to overcome problems that are suggested in the first negative statement, a discussion group and/or some type of social musical activity should be added to the videotaped lesson (see Notes for Distributor, p. 36).

PROPOSED REVISIONS

On the basis of the foregoing and personal experience, the following changes should be made if the videotape were to be used for music education:

1) Slides would be used on the téléciné to demonstrate the oscilloscope readings. I would also explain at the beginning of the programme the function of the oscilloscope. This change would be made in an attempt to correct the fact that 36.7% of the viewers did not clearly understand the function of the oscilloscope. (Note: This definition would normally appear in every lesson using the oscilloscope.)

2) The section on "relative pitch" would be modified, both verbally and with several musical illus-

trations to better explain this concept, since only 30% of the viewers correctly answered this question.

3) Slides would be used on the telecine to clearly illustrate visually a bass clef, and a bass clef might be drawn in an attempt to rectify the fact that only 23.3% of the subjects could draw a bass clef after having seen the programme.

4) The programme would be viewed in a room with better lighting conditions and a piano, so that the student could experiment on the piano if he wished.

5) A new videotape would be used after every ten subjects so that picture definition would be very good at every viewing.

CONCLUSION

This experiment proves that a self-instructional videotaped lesson in music appreciation can be an effective learning device in the affective domain, and a highly significant factor in the cognitive and psychomotor domains. Due to the subjects' unfamiliarity

with self-instructional learning situations, their unfamiliarity with music instruction and their initial dislike of previous music instruction, the experiment would probably be more successful when conducted on a long-term basis and in the content of the series of self-instructional programmes.

APPENDIX 1

RAW DATA FROM THE PRE-TEST QUESTIONNAIRE

A1 Have you ever taught yourself a subject, such as music?

yes (11) no (19)

A2 If so, to what degree did you enjoy learning by yourself?

immensely (0) very much (1) alright (10)

not very much (0) not at all (0)

A3 Have you ever used TV to learn about a subject, such as music?

yes (9) no (21)

A4 If so, did you enjoy using TV to learn about it?

immensely (0) very much (3) alright (6)

not very much (0) not at all (0)

A5 Have you ever studied music?

yes (12) no (18)

A6 If so, did you enjoy studying music?

immensely (1) very much (0) alright (6)

not very much (2) not at all (2)

B1 For how long have you studied music in school?

not at all (22) one year or less (5)

three years or less (2) five years or less (1)

seven years or less (0)

B2 For how long have you studied music outside school (for instance, with a private instructor)?

not at all (26) one year or less (3)

two years or less (1) three years or less (0)

four years or less (0)

B3 What it pitch?

correct answer (1) incorrect answer (29)

B4 Define "perfect pitch."

correct answer (0) incorrect answer (30)

B5 What is the function of a staff in music?

correct answer (0) incorrect answer (30)

B6 Please draw a bass clef on the back of this questionnaire.

correct answer (6) incorrect answer (24)

C1 Which note is higher (a tone interval)?

correct answer (25) incorrect answer (5)

C2 Which note is lower (a semi-tone interval)?

correct answer (13) incorrect answer (17)

C3 Hum the higher note.

correct answer (14) incorrect answer (16)

C4 Is the changed note higher or lower (in a triad)?

correct answer (15) incorrect answer (15)

APPENDIX 2

RAW DATA FROM THE POST-TEST QUESTIONNAIRE

A1 Did you enjoy learning by yourself?

immensely (6) very much (14) alright (9)

not much (1) not at all (0)

A2 Did you enjoy using a videotape to learn about pitch?

immensely (8) very much (17) alright (5)

not much (0) not at all (0)

A3 Would you like to learn more about music in this way?

yes (28) no (2)

B1 Please define pitch.

correct answer (25) incorrect answer (5)

B2 What are three reasons why one instrument may have a higher sound than another?

three correct answers (15) two correct answers (6) one correct answer (4)

none correct (5)

B3 What does an oscilloscope do?

correct answer (19) incorrect answer (11)

B4 What is "relative pitch?"

correct answer (9) incorrect answer (21)

B5 Please define the function of a staff.

correct answer (18) incorrect answer (12)

B6 Please draw a bass clef.

correct answer (7) incorrect answer (23)

C1 Which note is higher (a tone interval)?

correct answer (19) incorrect answer (11)

C2 Which note is lower (a semi-tone interval)?

correct answer (24) incorrect answer (6)

C3 Hum the tone with the higher pitch.

correct answer (26) incorrect answer (4)

C4 Is the changed note higher or lower in pitch (in a triad)?

correct answer (27) incorrect answer (3)

APPENDIX 3

PRODUCTION SET AND CREW

3 Cameras

2 Graphic stands

1 Piano with the front board removed in order to reveal inner workings

1 Monochord

3 Bottles of two different sizes (one partly filled with water)

1 Table

3 Lighted areas

1 Oscilloscope

Drums

1 Xylophone

Director and Producer.....Marilyn Cooperman

Script Assistant.....Klara Horne

Switcher.....Lawrence Vatch

3 Cameramen.....Ian Kaufman
Daphne Lenkorn
Ron Spivock

2 Graph Assistants.....Janet Coward
France Henri

Floorman.....Janet Coward

Narrator.....Rony Stein

Drummer.....Warren Cohen

Audio Man.....Richard Adams

Téléciné.....Richard Adams

CCU.....Richard Adams

Lighting Man.....Ron Spivock

Graphics Artist.....Leslie Takach

APPENDIX 4

SCRIPT

The Highs and Lows in Music

SHOT	NARRATION	MUSIC
1 cu 2 title graphic		excerpt from Mozart at specified pitch ($\frac{1}{2}$ minute)
2 cu 3 keyboard		same excerpt transposed an octave higher ($\frac{1}{2}$ minute)
3 cu 1 face	Hi, today we are going to discuss the nature of high sounds and low sounds in music. Notice how the first musical excerpt was played on sounds lower^	few notes from first excerpt

SHOT	NARRATION	MUSIC
4 cu 2 keyboard	than the second part ^	few notes from second excerpt
5 cu 3 face	This is done by using high sounds and low sounds at different times. The difference between a high sound ^ and a low sound ^ is called PITCH. A high sound is "high" in pitch and a low sound is "low" in pitch. Today we are going to study the different dimensions of pitch in music.	a high note a low note
6 mcu drummer	We can have music without differences in pitch, stressing instead rhythm rather than melody^	drum excerpt
7 cu 3 face	but almost all music does have variety in pitch. The musical excerpt you just heard are sounds played at the same pitch and	

SHOT	NARRATION	MUSIC
	organized into a series of patterns. The first melody we heard was also sounds organized into a series of patterns, except that the sounds were played using a variety of pitches. ^	excerpt from Mozart (15 sec.)
8 cu 2 keyboard	If I hold a note for a long time,^ now a short time ^	sustained note staccato note
9 cu 3 face 10 cu 2 keyboard	does the pitch of the sound change? (pause) (Ans.) If this same note is played loud,^ now soft ^	loud note soft note
11 cu 3 face	does the pitch of the sound change? (pause) (Ans.) So the length of time a note is held for and the loudness or softness of a note does not mean a change in the pitch of the sound. Do you know how pitch is produced?	

SHOT	NARRATION	MUSIC
12 mcu 2 monochord	Let's look at our monochord	
13 cu 2 strings of monochord	Like the piano the monochord is	
14 cu 1 piano strings	a stringed instrument.	
15 cu 2 monochord	You can see how the monochord's sound is produced by the vibration of the string as it is plucked ^	pluck monochord string
16 cu 1 piano, zoom in to show hammers	The piano's sound is similarly produced by the vibration of a string ^ but in the case of the piano, the vibration is caused by a hammer effect, whereas with our monochord we pluck the string.	play note
17 cu 2 monochord	Pluck your monochord.^ We can <u>hear</u> the sound.	pluck mono-chord string

SHOT	NARRATION	MUSIC
18 cu 3 oscillos-cope	Now with an oscilloscope we can <u>see</u> what the vibration of this sound looks like.	
19 cu 2 face	When the string is plucked it produces a vibration or sound wave.	
20 cu 3 oscill. then move to face	This particular vibration has a specific pitch name and is called 'G'. (Remember your scales from Lessons #2 and #3, where we learnt that each pitch sound has a different name, beginning with A, B, C, D, E, F, G.)	
21 cu 2 monochord	If you divide your monochord's string in $\frac{1}{2}$ at the $\frac{1}{2}$-way mark,^is sound different from the first sound?^^ If it is different, is the sound higher or lower? (pause) (Ans.)	pluck $\frac{1}{2}$ string pluck undi-vided string pluck $\frac{1}{2}$ string

SHOT	NARRATION	MUSIC
22 cu 3 oscill.	Let's see the vibration of this new sound on the oscilloscope.^ You notice how the vibration waves are closer together. This is caused by the higher pitch of the sound.	pluck $\frac{1}{2}$ string
23 mcu 2 monochord	Divide the string into 2/3 at the 2/3 mark, listen to the pitch;^ would you say the new sound is higher or lower than the sound produced by the undivided string? (pause) (Ans.)	pluck 2/3 string
24 mcu 2 face	Can you make the pitch lower on your monochord? (pause) demonstration.^^	divided strg.plucked undivided strg.plucked
25 mcu 3 monochord	So pitch is produced by the vibration of a string or other kind of	

SHOT	NARRATION	MUSIC
	elastic material. And different kinds of vibrations produce different kinds of pitch.	
26 mcu 2 face	You have probably heard the term "perfect pitch." If I said you have perfect pitch, what would this mean? (pause) It actually has two meanings. The first meaning is when you are able to recognize the pitch of a note as it is played (demonstration)^. The second meaning is when you can produce a specified pitch before having heard it played (demonstration)^. Now you try it, sing the pitch of C, now I'll play it on the piano.^ Did you come close? Can you sing a few notes in a popular song and reproduce the sounds that are in the song? Try it. If you can,	play note sing Middle C play Middle C

SHOT	NARRATION	MUSIC
	you have "relative pitch."	
27 mcu table with instruments	If we use different instruments, will the same pitch sound exactly the same on each instrument? Let's experiment. Since the human ear sometimes has a hard time distinguishing between the pitch of different instruments. Let's go back to our oscilloscope.	
28 cu of face and instrument	^Hummmm, the vibrations produced by these different instruments playing a sound at the same pitch are different.	note A played by each instrument separately
29 cu face	Can you guess why. This difference in sound quality is called TIMBRE. Keep your guesses for the lesson on Timbre; and in the meantime, don't be fooled,	

SHOT	NARRATION	MUSIC
	different instruments can play the same pitch but the sounds produced will not necessarily sound exactly alike. So far we have learnt that pitch is the relative highness and relative lowness of a sound, that it is caused by vibrations, and these vibrations differ on different instruments. Let's try and find out why these vibrations are different.	
30 cu 1 narrator walks over to table, strike	Let's experiment with the size of an instrument. Take a large bottle and a small bottle. Strike each of them lightly with your pencil.	
31 cu 2 bottles	Which has the higher sound? (pause) Ans.	

SHOT	NARRATION	MUSIC
32 cu 1 face	So size affects pitch. Does the length of a string affect pitch? Do you remember how to produce a higher pitch on a monochord - play a pitch and then play a higher pitch. Now I'll do it.	
33 cu 2 monochord	First, I'll play the string as it is^- undivided. Now I'll divide the string.^	pluck undivided string pluck divided string
34 cu 1 face	Is the sound different? So the length of the string affects pitch. I wonder if the quantity of air in an instrument will affect pitch? Take a bottle, blow into it,^ remember the sound. Now take	 blow into bottle

SHOT	NARRATION	MUSIC
	the bottle which is half filled with air because we filled it up halfway with water, blow into this bottle.^ Does the quantity of air affect the pitch? (pause) (Ans.) So now we know that the pitch of a sound is affected by size, length of string and the amount of air used in the instrument.	blow into half-filled bottle
35 mcu 2 table pan across objects	A large size produces a lower sound than a smaller size instrument. A longer length of string produces a lower sound than a shorter length of string and the more air used in an instrument the lower the sound will be.	
36 mcu 2 face	But if we want to sing a certain sound or play an instrument at a	

SHOT	NARRATION	MUSIC
	certain pitch, how do we know exactly which sound to play?	
37 cu graphic 1 (1)	^When man first made music, his tunes were simple and were probably memorized by his children and passed on to their children by the same method.	voice over, up tape of simple tune
38 graphic 2 (2)	Later,^ man began to make musical instruments and sing more complex songs which people found hard to memorize. To help people memorize these tunes and melodies Western man began to use Neumes which looked like this.	tape of more complex music with voice
39 graphic 3 (1)	These neumes indicated the relative higher or lower pitch of one sound to another sound.	
40 graphic 4 (2)	By the 9th Century, lines were used to indicate specific pitch.	

SHOT	NARRATION	MUSIC
41 graphic 5 (1)	More and more lines were added until we arrived at a staff of 5 lines and 4 spaces. This staff is still used in conventional Western music.^ Each line and each space indicates a specific pitch. Different kinds of notation are used in more contemporary music and for music from other lands.	stop music
42 graphic 6 (2)	Music for the piano is written on two staves.	
43 graphic 7 (1)	The top or treble staff is used for all the pitches above Middle C.^	play some notes above Middle C
44 graphic 8 (2)	The bottom or bass staff is used for all the pitches below Middle C.^	play some notes below Middle C

SHOT	NARRATION	MUSIC
45 (2) slow zoom out to include narrator	In order to raise the pitch of a note a semi-tone^(i.e., shorten the string slightly), we place the note on the proper line or space and then we place a sharp in front of the note. To lower the pitch of a note a semi-tone (i.e., lengthen the string slightly), we place a flat in front of the note.	play note, raise a semi-tone play note, lower a semi-tone
46 cu 1 face	What is used to lower the pitch of a note? ^(pause) Ans. Draw a flat.	play note, lower it
47 cu 2 on drawn flat		
48 cu 1 face	What is used to raise the pitch of a note?^ (pause) Ans. Draw a sharp.	play note, raise it

SHOT	NARRATION	MUSIC
49 cu 2 on drawn sharp		
50 film insert	The idea of what music really is is constantly changing to fit society's and the individual's likes and dislikes. Certain dimensions of music, however, are constant, and pitch is an important element in the appreciation of music. ^Next lesson we will study how rhythm in music imitates our heartbeats and reflects our innermost moods.	tape of heartbeat

APPENDIX 5

BUDGET OF ACTUAL PRODUCTION COSTS

Piano (tune)	$ 12.00
2½ hour videotapes	60.00
Actor (narrator)	25.00
Musician	5.00
Rental of record	4.00
	$ 106.00

ESTIMATED PROFESSIONAL BUDGET*

Studio	$ 35.00	per camera hour
½ hour videotape	25.00	
½ hour audiotape	6.00	(no equipment included)
1 actor	81.60	(for ½ hour show, including six hours of work time)
2 musicians	168.53	(for ½ hour show, three hour session)
1 artist (for graphics)	14.00	

1 script assistant	$ 14.00	
1 lighting manager	11.00	
Switcher	11.00	
Floormanager	14.00	
3 cameramen	33.00	
1 audioman	11.00	
2 stagehands	28.00	
Videotape editor	50.00	(with equipment or $11.00 per hour)
Boomman	11.00	
Propman	14.00	
Makeup staff	14.00	
Technician	11.00	
Director	200.00	per day - unlimited hours
Producer	200.00	per day - unlimited hours

*The actual production time for the videotaped programme took seven hours. Professional crews, however, would most likely take less time, so the cost per hour instead of the cost per show is given. These figures are based on information given to me by Mr. Leonard Weinstein, a producer at CBMT in Montreal, Quebec.

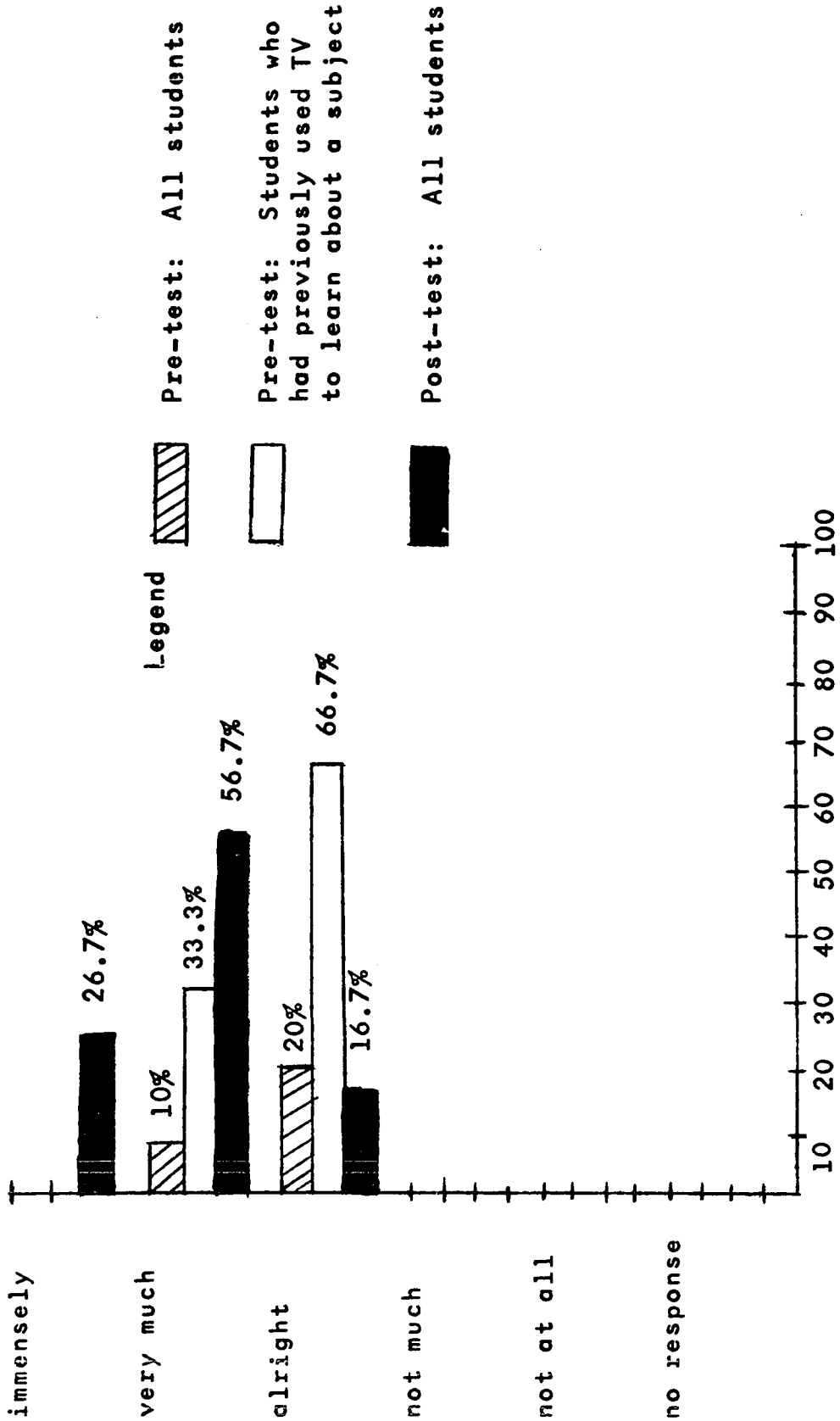

FIGURE 1: Responses of students to the question, "Did you enjoy using a videotape to learn about pitch?" (See Appendix 1, item A4 and Appendix 2, item A2.)

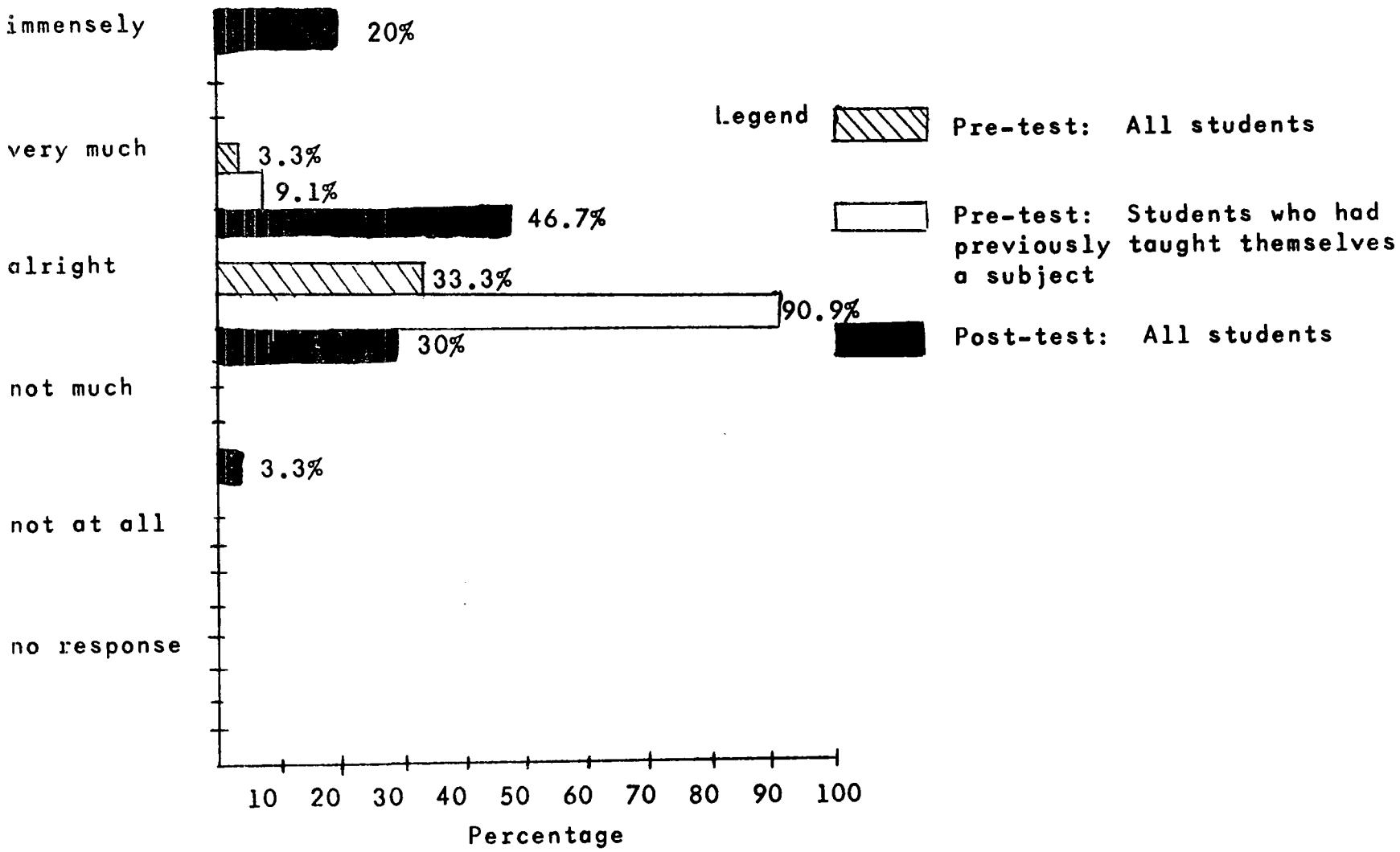

FIGURE 2: Responses of students to the question, "Did you enjoy learning by yourself?" (See Appendix 1, item A2 and Appendix 2, item A1.)

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