

GUIDELINES FOR SELECTION AND IMPLEMENTATION OF
AN ELECTRONIC PIANO LABORATORY FOR USE IN THE
DEPARTMENT OF MUSIC AT TEXAS WOMAN'S UNIVERSITY

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT
THE DEGREE OF MASTER OF ARTS IN MUSIC EDUCATION
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

COLLEGE OF FINE ARTS

BY

NANCY SHARON PRINCE, B.S.

DENTON, TEXAS

AUGUST, 1971

Texas Woman's University

Denton, Texas

August 6 19 71

We hereby recommend that the thesis prepared under
our supervision by Nancy Sharon Prince
entitled Guidelines for Selection and Implementation
of An Electronic Piano Laboratory For Use in the
Department of Music At Texas Woman's University

be accepted as fulfilling this part of the requirements for the Degree of
Master of Arts

Committee:

R. L. R. Bentley
Chairman
Thomas K. Brown
Gregory S. Eaton

Accepted:

L. L. Messers
Dean of Graduate Studies

ACKNOWLEDGMENT

The author is grateful to Dr. Richard R. Bentley for his guidance and understanding in the preparation of this thesis. His influence can neither be measured nor equaled.

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CHAPTER ONE

Introduction

PURPOSE: The purpose of this paper was to identify the need for the purchase of an electronic piano lab, and to establish guidelines to aid the Music Department of Texas Woman's University in the selection of the best lab available. Consideration was given to the implementation of a program designed to suit the requirements of the various degree programs of the Music Department as well as serving needs of non-music majors.

JUSTIFICATION OF THE PROBLEM: The room in which the fundamentals courses for elementary education majors are now being taught is furnished with eight pianos of differing makes, sizes, touches, and various degrees of tuning. This is, in some instances, a hindrance to the teaching of the skills needed by these students. Dr. Lawrence Rast says that

The use of large multiples of conventional pianos cannot help but create a magnitude of sound which permeates every learning activity, and musical sensitivity may be easily lost in a mass of confused sounds as students attempt to learn together in performance. The scheduling of tuning the conventional pianos creates a problem as many class piano rooms are used jointly for theory, music education classes, and the regular functional piano courses. This hourly usage allows little time for maintenance.¹

One major objection to the present situation is that the student does not have the freedom to progress at her own rate

of speed. "With the electronic piano laboratory, individual needs can be resolved in addition to permitting all of the valuable aspects of group instruction."

Many people object to the electronic piano lab because the pianos are so unlike conventional instruments.

As a musical instrument, it (the electronic piano) does not replace the traditional piano, but its size and arrangement makes it a functional teaching tool that relates to all musical experience, and at the same time starts one on his way to become an accomplished pianist or organist if so inclined.

PROCEDURES: The purpose of the questionnaire was to determine the successes and failures of other schools with the electronic piano labs and to use this information to aid in implementing an adequate program at Texas Woman's University.

The schools that were sent a questionnaire were chosen from the alphabetical listing by states in the 1971 Directory to the National Association of Schools of Music. The author first chose every fourth school in the listing. This method eliminated some states completely and produced a large number of schools from others. Therefore, the states having five or more schools from the first method were reduced in number by withdrawing schools from their lists and adding schools from the states with none chosen. The final result was that each state listed in the NASM Directory had at least one school chosen and no more than three. Schools were selected at random by the author with no comparison of size and/or location. A list of the schools selected and sent a questionnaire may be found in Appendix A of this paper.

ORGANIZATION: The paper consists of four chapters:

The first chapter serves as an introduction and includes the purpose and procedures to be used in the paper.

The second chapter presents comparative data of the four leading electronic piano lab systems: Baldwin, Fender-Rhodes, P. A. Starck, and Wurlitzer. Various features of each system are discussed: how they compare, how they differ, prices, and purported repair needs. Also included in this chapter is a review of the literature dealing with electronic piano labs.

The third chapter presents a compilation of answers received from selected NASM schools returning a questionnaire designed especially for the study.

The final chapter, four, draws conclusions from the information gained from the comparative data and the questionnaire.

1. Lawrence R. Rast, "Functional Piano For Tomorrow's Educator's," Music Journal, February, 1968, p. 37.
2. Ibid.
3. Arthur G. Harrell, "The Piano Keyboard ... A Teaching Machine," Music Journal Annual, 1969, p. 49.

CHAPTER TWO

Review of Literature

Dean Boal was speaking of electronic piano labs when he said, "You can succeed with it only if you do not ask it to do things it cannot."¹ Boal advocates the use of the electronic piano lab especially for beginning piano, but stresses that there comes a time when students must change and use conventional instruments. "When the student and teacher come to style, interpretation, nuance, and touch, then clearly they will have to work at a real piano."²

In Wichita, Kansas, the Wurlitzer lab is used in large air-conditioned vans, made into electronic piano classrooms. This allows more students to study and permits those who are underprivileged to afford piano lessons.

As a musical instrument, it does not replace the traditional piano, but its size and arrangement makes it a functional teaching tool that relates to all musical experience, and at the same time starts one on his way to become an accomplished pianist or organist if so inclined.³

Lawrence Rast, in his article "Functional Piano for Tomorrow's Educators," lists several reasons in support of electronic piano labs.

The use of large multiples of conventional pianos cannot help but create a magnitude of sound which permeates every learning activity, and musical sensitivity may be easily lost in a mass of confused sounds as students attempt to learn together in performance. The

scheduling of tuning the conventional pianos creates a problem as many class piano rooms are used jointly for theory, music education classes, and the regular functional piano courses. This hourly usage allows little time for maintenance.⁴

Rast continues by saying that "with the electronic piano laboratory, individual needs can be resolved in addition to permitting all of the valuable aspects of group instruction."⁵

In his doctoral dissertation Rast suggested several specific recommendations for courses involved in elementary education teacher-training. He stated that

...one or two semesters of functional piano instruction be included as a part of teacher-training programs in elementary education; that the concept of group piano instruction be considered the most effective mode of instruction for the development of functional piano facility be elementary teacher-training students; that instructional personnel include either specialists in music education who have strong backgrounds in the teaching of piano, or persons who themselves have had experience in the regular classroom music programs, and who have an adequate performance and teaching ability at the piano; ...⁶

The extent to which the electronic piano labs are used was implied by Miss Nancy Stephenson of North Texas State University who said that "at North Texas they have had fourteen Wurlitzer electronic pianos for the past three years and they have been used eight hours a day, five days a week."⁷

Other pertinent questions such as which lab is used most often, how many pianos are usually used in a lab, and what text book is used, will be answered in the following chapter in regard to the questionnaire answers.

Comparative Data

Four electronic piano labs are commercially available today and are easily accessible for purchase. The manufacturers of these systems are: Baldwin⁸, Fender-Rhodes⁹, P. A. Starck¹⁰, and Wurlitzer¹¹. Each are discussed separately, listing their specific characteristics. (Table I)

BALDWIN ELECTROPIANO LABORATORY

The Baldwin Electropiano resembles a conventional piano in that there are eighty eight keys struck by felt hammers against tuned strings. The finely regulated action produces the touch and tone, modified by the sustain and soft pedals of a regular piano. This system also comes in a sixty four note model if space will not allow the full eighty eight note keyboard.

The conventional wood sound board was replaced by an electronic pickup system reported to produce sound with characteristics similar to a wood sound board. Sounds are amplified after the key is struck.

There are two basic units of this system available: The Studio Lab for as many as six students, and the Classroom Lab, for as many as twenty four students. Each lab includes the teacher's piano and control center.

The instrument is thirty one inches high so the student has ample room to see the teacher, chalkboard, or other visual aids. The frame of the piano is $17\frac{1}{2}$ " x 56", or $17\frac{1}{2}$ " x 44" for the sixty four note model.

The Baldwin lab allows the teacher four different teaching techniques: individual, class, ensemble performance, and audio aids. As many as six students can play together, hearing each other's instrument and the teacher.

The control center, with all controls arranged within a single hand span, is placed on top of the teacher's piano. The Classroom Lab (up to twenty four students) is divided into four groups of no more than six pianos. The teacher can work with one or more of the groups in any of the four functions. Two groups may work individually, one group in ensemble, and the fourth with an audio aid, for example. In the Studio Lab, the class is treated as one group.

A lease contract may be obtained for the Baldwin system. The minimum term is six months with an option to purchase the lab at a guaranteed price. The lab will be installed by the Education Division engineers. A warranty provides for the replacement of any parts found defective within one year after the purchase date without any charge for materials, labor or transportation provided the lab has been serviced only by Baldwin personnel. Through the fifth year after the purchase date, Baldwin will replace, with no charge, parts found to be defective, but labor and/or transportation must be paid by the owner.

The price range of the Baldwin systems is as follows:

Studio Lab--Teacher's piano with cabling for six student pianos, teacher's headset and adjustable stool with six eighty eight note student pianos,

custom installed--\$4,800

or with

Six, sixty four note student pianos, custom installed--
\$4,200.

Classroom Lab--Teacher's piano with cabling for
twenty four student pianos, teacher's headset and
adjustable stool with six, eighty eight note student
pianos, custom installed--\$5,180

or with

Six, sixty four note student pianos, custom installed--
\$4,550.

The cost to expand a lab is as follows:

Each additional eighty eight note student piano--
\$685

or

Each additional sixty four note student piano--
\$580.

FENDER KEYBOARD INSTRUCTION SYSTEM KBS 7024

The complete Fender Keyboard Instruction System KBS 7024 consists of twenty four student pianos, teacher's piano, teacher's control console, and one control console desk, the purchase of which is optional.

The piano is constructed of fiberglass. Each piano has its own control panel from which the instructor or student can turn the piano off or on, control the volume, and control the speed of the metronome. There is also a switch that enables the student to

signal the instructor if he is in need of help.

The Fender system provides two-way communication between the student and teacher. The instructor may talk and/or play for each student privately. This type of communication may be initiated by either student or teacher. The instructor may monitor a student with or without the knowledge of the student.

Another feature of the Fender System is a provision by which the teacher may isolate any conceivable combination of students for separate ensemble work. As many as five isolated activities may be carried on at one time.

The Fender System also features a built-in metronome which may be operated by the student and is a standard fixture on all pianos.

As with the Baldwin system, the Fender pianos offer touch dynamics. However, the hammers of the piano strike a modified tuning fork, thus eliminating some of the tuning problems which would result with a stretched string instrument.

The piano used in the Fender KBS 7024 System is the Fender-Rhodes electric piano. It is a seventy three key, six octave (E to E) instrument featuring the patented Rhodes keyboard action.

There are three types of communication afforded with the Fender System: normal, which allows the teacher to communicate with any particular student and allows individual instruction; ensemble, used when the instructor desires to talk to two or more students at the same time; and master, used when the instructor wishes the attention of the entire class.

Fender Musical Instruments warrants all parts in the pianos and instructor's console for ninety days after proper installation. The defective parts will be replaced without cost except the expenses of labor and/or transportation.

The cost of the Fender Keyboard System is as follows:

One student or teacher's six-octave piano with metronome, signal switch, sustaining pedal, earphone, and microphone--\$575.00

One instructor's console with lighted switches for two-way communication and/or ensemble grouping for as many as twenty four students, and lighted switches for monitor or communication with any one or group of students privately--\$695.00

One control console desk with speaker and ability for connecting more than one piano for simultaneous performance--\$290.00.

P. A. STARCK PIANOTRON

The Starck Pianotron has true piano sound and touch. It has treble and bass volume control as well as general volume control. The keyboard contains seventy four notes. The hammers are wood felt and the bass strings are copper wound.

There is no sounding board in the pianotron. The keyboard is removable, and the legs and pedals may be folded in for easy storage.

The pianotron weighs 190 pounds and has the following dimensions:

45 3/4" long, 21" in depth, and 34½" high.

The control center allows the teacher to listen to one or more students, and also one or more students may listen to each other through their headphones. Each student hears only his piano. The instructor may talk to any one or all of the students. Groups of as few as two and as many as twelve students can be instructed at the same time.

The instructor may also adjust the volume on any of the pianos, making it louder so that the entire class may listen to one student, for example.

Following is a price list for the Starck Pianotron:

Pianotron - - - - -	\$545.00
Revolving Bench - - - - -	\$8.00
Headphone set - - - - -	\$14.97
Headphone set with mike - - - - -	\$23.97
Control center with stand - - - - -	\$295.00
Starck tone cabinet - - - - -	\$159.00
Headphone extension cord - - - - -	\$3.00

WURLITZER MUSIC LABORATORY

The Wurlitzer Music Laboratory can be used with groups numbering up to twenty-four students. The keyboard consists of sixty four notes, but the "landmarks" on either end of the piano are the same as a conventional instrument--the lowest note is "A" and the highest note is "C".

A steel reed tuning mechanism is used in the Wurlitzer pianos, thus making it more difficult for tuning problems to arise.

The Wurlitzer Electronic Communication Center permits the teacher to be in control of four separate activities at one time. The instructor may use audio instructions from records and tapes. One group of students may listen to a record, while another group listens to a tape. The teacher may then work with two ensemble groups, or one ensemble group and individual instruction in the other group.

A tape recorder may be plugged into the back of the piano and a student can play along and tape his performance. While this student records, the remainder of the class may work on their own individual music, work in ensemble, or listen to the student taping.

There are two different models of the Wurlitzer electronic labs available: The Wurlitzer Student Portable Electronic Piano--Model 146, and the Wurlitzer Student Console Electronic Piano--Model 726. The Model 146 is equipped with padded earphones, convenient volume and other controls, and a sustaining pedal. The height is $33\frac{1}{2}$ inches, width 29 inches, depth $21\frac{1}{2}$ inches, and it weighs eighty four pounds. The 726 Model also has padded earphones and volume and other controls, but includes a soft pedal in addition to the sustaining pedal. The height is $34\frac{1}{2}$ inches, width is 42 inches, depth 22 inches, and it weighs 120 pounds.

No price list was sent concerning the Wurlitzer labs even after a second request; however, one of the brochures reveals the following:

The initial cost of the Music Laboratory is much

lower than comparable laboratory equipment for other educational fields. Maintenance cost is negligible as pianos stay in tune . . . space cost is less because compact pianos with 'silent' features require less room . . . and instruction cost is less, in many music areas, as one teacher can instruct a participating class of many students.

The Wurlitzer Music Laboratory has been funded under titles of the Elementary and Secondary Education Act (Public Law 80-10).

1. Dean Boal, "Turning On Students," Time, v. 92, n. 1, 1968, p. 92.
2. Ibid.
3. Harrell, p. 49.
4. Rast, p. 38.
5. Ibid.
6. Lawrence R. Rast, "A Survey and Evaluation of Piano Requirements for Students Enrolled in Programs of Teacher-Training in Elementary Education at Selected Colleges and Universities in the State of Illinois," Dissertation Abstracts, v. 25, nos. 5 and 6, p. 3610.
7. Stephenson, Interview, June 15, 1971.
8. Baldwin Piano and Organ Company, Education Division, 1801 Gilbert Avenue, Cincinnati, Ohio 45202
9. Fender Musical Instruments, 1402 East Chestnut, Santa Anna, California 92701
10. P. A. Starck Piano Company, 2610 North Ashland Avenue, Chicago, Illinois 60614
11. Wurlitzer Company, DeKalb Division, DeKalb, Illinois 60115

Table I

	no. of keys	hammers	pedals	dimensions	
Baldwin	88 or 64	felt strikes string	soft and sustain	31"H 88 keys: 17½"x56"	64 keys 17"x44"
Fender	73	felt strikes modified tuning fork	sustain	?	
Starck	72	wood felt	soft and sustain	34"H 45 3/4" x 21"	
Wurlitzer	64	?	Model 146: sustain Model 726: sustain and soft	Model 146: 33½"H 39"x 21½"	Model 726: 34½"H 42"x 22"

CHAPTER THREE

Questionnaire Analysis

Questionnaires were sent to eighty eight schools chosen from the Directory of the National Association of Schools of Music. A copy of the questionnaire may be found in Appendix B.

Of the eighty eight questionnaires sent, 48% were returned. From this number, 57% reported having electronic piano labs, while 43% reported not having one. Of the 43% answering no, 79% said that they were giving thought to purchasing a lab in the near future, and 21% said they were not considering the purchase of a lab.

In answer to the question "What is the make of your piano lab?", 41% of the schools reported owning Wurlitzer labs. The second most mentioned lab was Baldwin with 12%; third was Fender-Rhodes with 10%; and finally P. A. Starck that was not listed by any school. The apparent popularity of the Wurlitzer labs is possibly due to the fact that for a period of time these were the only labs of this kind available, while the obvious disinterest in the P. A. Starck is probably due to the fact that it is a relatively new system and has not yet had the time nor opportunity to gather a following.

The number of pianos in each lab ranged from six to twenty four. While 21% of the schools reported a need for more pianos,

no reasons were given for this need. Two per cent of the schools felt that a smaller number of pianos was more effective. These schools felt that an average of twelve pianos in each classroom was sufficient.

The questionnaire was designed to discover what qualifications were needed by the teacher who would teach the courses in class piano. It was reported by 41% of the schools that they employ a specialist in class piano to work in this type of classroom. Regular faculty piano instructors were employed by 27% of the schools; music education instructors by 15%; while 17% listed various other people who taught these classes, such as theory staff, graduate assistants in music education, and teaching assistants under the direction of a specialist.

The questionnaire was also concerned with the various ways in which the electronic labs are used. From the schools answering the questionnaire, 50% use the labs in teaching beginning piano to music majors, and 45% in teaching beginning piano to non-music majors. The labs are used in conjunction with theory classes by 43% of the schools. Thirty one per cent of the schools use the labs in connection with the music fundamentals course for elementary education majors. Other uses of the labs, listed by 15% of the schools, were: teaching piano literature, teaching preparatory school students, teaching piano for pleasure (Education for townspeople), teaching piano skills for piano and piano pedagogy majors, and individual practice studios.

If the schools replied that their lab was used in connection with the music fundamentals course for elementary education majors, they were asked who was in charge of the lab for these classes. In this situation 29% said that these labs were taught by the music education instructor in charge of the course. This time only 8% listed a class piano specialist as the instructor, and only 3% listed a regular piano faculty instructor. Other types of teachers were listed by 12% of the schools, such as graduate assistants, student assistants who are piano majors supervising practice sessions, and the theory staff.

Once it was established in what ways the labs were used, the questionnaire was concerned with the course content of the various classes. In the music fundamentals courses for elementary education majors, 31% of the schools concentrate on teaching the playing of simple accompaniments to songs in an elementary song book. Twenty seven per cent of the schools teach simple harmonic progressions, 17% teach sight reading, and transposing and improvising are each taught by 12% of the schools.

In connection with beginning piano, the playing of simple accompaniments, sight reading, and the harmonization of melodies were each listed separately by 45% of the schools. Transposing was listed by 33%, and improvising by 31%. Only 10% reported the teaching of the playing of an octavo score, and only 8% listed the playing of a condensed orchestra or band score. Other areas of concentration were listed by 8% of the schools, such as repertoire,

technique (five-finger exercises, scales, arpeggios, etc.), and traditional literature by keyboard masters. One comment was that beginning piano was taught to all instrumental music education majors in the lab, while vocal and piano music education majors study with the piano faculty.

Two areas of concentration were listed by 36% of the schools in connection with the teaching of functional piano, those of playing simple accompaniments and sight reading. Transposing was listed by 27%, reading chord symbols by 24%, and improvising by 31%. The teaching of repertoire and scales were other uses listed by 5% of the reporting schools.

In conjunction with theory classes, 38% of the schools use the piano lab to teach harmonic progressions and 31% to teach modulation. Scales are taught in the lab by 27%, transposition by 20%, and improvisation by 17% of the schools. Other uses, listed by 5% of the schools, were the teaching of chromatic harmonies and the realization of figured melodies or bass.

The time spent per week by each of these classes was also a concern of the questionnaire. In connection with the fundamental courses for elementary education majors, the time spent per week in 10% of the reporting schools was one hour, three hours in 8% of the schools, and only one half hour in 3%. Another 8% related that the time spent varies from week to week.

Beginning piano classes were reported by 41% of the schools to spend two hours per week in the lab. One hour per week and three hours per week were each listed by 5% of the schools, while another 5% reported using the lab five or six hours per week.

Functional piano classes were reported by 24% of the schools to meet two hours per week, while 3% listed three hours per week of class time.

Theory classes spend two hours per week in the lab in 17% of the schools, one hour per week in 12%, and one half hour per week in 5% of the schools. The time spent in the lab varies from week to week in 8% of the schools.

As was stated previously, 43% of the schools replied that they did not own an electronic piano lab. Twenty one per cent of these schools gave as their reason for not owning a lab the fact that they are too costly. Ten per cent of the schools related that they did not have sufficient space nor a sufficient need to purchase a lab. Having no one qualified to teach in this situation was listed by 8% of the schools. Other reasons, given by 5%, were that they would wait to purchase a lab for a new building, and they were not convinced this is the best method to teach minors.

From the 43% of these schools that do not own a lab, 73% related that they are giving thought to the purchase of a lab in the near future. When asked what types were being considered by their schools, Baldwin was the system mentioned most often with 29%. Wurlitzer and Fender-Rhodes labs were each listed by 17% of these schools, and 5% stated that they were considering the system built by P. A. Starck.

After purchase of an electronic piano lab, 31% of these schools propose to use the lab to teach functional piano, 27%

to teach beginning piano to music majors in conjunction with theory classes, and 20% in conjunction with the fundamentals of music courses for elementary education majors. Piano preparatory, teaching beginning piano to secondary students, and use as a practice studio were listed by 8%.

When asked who would teach in the class piano lab, 24% of these schools related that they would employ a class piano specialist. Regular faculty piano instructors will be employed by 20%, and 12% will use the music education instructor. Other people, listed by 5% of the schools, were the theory staff and senior piano majors as part of the piano pedagogy lab.

Pertinent comments were made by four instructors completing the questionnaire. Arthur Corra, Director, School of Music, University of Oklahoma, said "we use electronic pianos only for the first year of class piano. In the second year, we use real pianos and limit the class size to six."

Helen Harlan of Indiana University says that they "could not operate without their two electronic piano labs. They are in use every day and almost every hour from 8:00 to 4:00."

Concerned with the question of who should teach in the class piano lab was Wanda Martin of the Lamont School of Music, University of Denver. She said "for a piano lab and/or group piano to be effective the instructor MUST be highly trained in the areas of piano, theory, history--plus group dynamics and other related areas of psychology. Class piano has received a 'bad name' because of

unqualified teachers." And J. Dayton Smith of San Diego State College observed that they "find only class piano specialists use the full potential of the lab."

Review of Present Practices

The Music Department of Texas Woman's University presently teaches an average of four or five sections of the music fundamentals course for elementary education majors. The number of students enrolled in these courses is approximately 100 each semester. This large number of sections is necessary to limit the class sizes in order to make the most efficient use of the present physical plant.

During the past there were two sections of freshman theory with an average of thirty students each, and one sophomore class with approximately thirty students enrolled. Projecting into next year, if the majority of the freshman students continue in music, there will be two sections of sophomore theory, and, if the same number of freshman enroll in the fall, there will again be two sections of freshman theory.

It is not known how many students will be enrolled for private instruction in piano, but the number is always sufficient to enable faculty members to have full teaching loads, as well as employing graduate teaching assistants to teach the overflow from the faculty.

Functional piano is a requirement for music therapy majors and is now taught individually by the music therapy instructor.

The number of students enrolled in functional piano is usually small due to the smaller number of therapy majors.

CHAPTER FOUR

Conclusions

On the subject of electronic piano labs Dean Boal had this to say: "You can succeed with it only if you do not ask it to do things it cannot."¹ When in the process of purchasing an electronic lab one must not think that this is the answer to all of the problems facing the music department. There are some things the piano lab cannot do, but there are many ways in which it can help to alleviate some of the problems.

In the Music Education Department there are several ways the electronic piano lab could be used effectively. The first problem is that students are reticent when they have to play before their peers, and in the present situation they have no choice. With an electronic piano lab the student can practice and perform without fear of someone else listening. After the student has gained some confidence, she could participate in ensembles or perform for one or more of her fellow students.

The eight pianos in the room used for the fundamentals of music courses are separated by the length of the room, four on each end. An electronic piano lab would solve this problem through the use of headphones, allowing for ensemble work. With a lab, the pianos now being used for the fundamentals courses could be moved into practice rooms to fill the need for more places to practice,

in addition to using the lab itself as a practice studio.

Another problem to consider is the insufficient amount of time now being spent in playing the piano. With class sizes ranging up to thirty two students, eight pianos can only serve a very small percentage of a class effectively. Every student should have an opportunity to work at least one hour per week at the keyboard. To reach this goal in the present situation, the instructor would have to forego all academic work and spend all class meetings at the keyboard.

An electronic piano lab with twelve student instruments and one teacher's console would allow each music fundamentals class to be increased to thirty six students. Three sections of the class would accommodate 108 students opposed to the 100 students now being taught in four or five sections. Each class could be divided into three groups of twelve students to work on keyboard skills in the piano lab one hour per week.

This situation would create a problem in regard to the number of teaching hours allowed one instructor. If it should be the decision of the Department to have the music education instructor in charge of the class to teach in the lab, the instructor would have six hours contact time for a three hour course (three hours for the lecture plus three separate lab sections). Another possibility is that the labs could be taught by graduate assistants working directly under the instructor in charge. This would leave the faculty instructor with three hours credit and three contact hours in the class.

If the Department felt it best that the same instructor teach both the lecture and the lab classes, the course could be changed to a two hour lecture course with a one hour lab. In this way the instructor would receive two hours credit for the lecture plus three hours for the three sections of lab classes for a total of five hours credit.

However, an electronic piano lab of eighteen student pianos and one teacher's console would allow the number of students in the music fundamentals sections to be increased to thirty six, but only two separate lab groups would then be necessary. The instructor in charge of the class would have five contact hours for the three hour course (three hours for the lecture plus two separate lab sections). Or, the course could again be changed to a two hour lecture with a one hour lab. In this way the instructor would receive two hours credit for the lecture and two hours for the lab.

It would appear that with this many students already involved in the lab, there would be little time left for any other classes to use the lab. But let us consider the total number of hours the lab could be available for use. On Mondays, Wednesdays, and Fridays the lab could be used eight hours a day or twenty four hours per week. On Tuesdays and Thursdays it could be used seven hours a day or fourteen hours per week. This creates a total of thirty eight available hours per week.

If the Department purchases twelve pianos and there are

three sections of thirty six elementary education students, the total number of lab hours needed for these courses would be nine hours per week, leaving twenty nine hours open for theory classes, beginning and/or functional piano classes, and for use as a practice studio. Should the department purchase eighteen pianos and there are three sections of thirty six elementary education students, the total number of hours needed for these courses would be six hours per week, leaving thirty two hours per week free for other uses.

The problems discussed thus far have dealt only with music education. The electronic piano lab can serve the entire Music Department. It has already been stated that with the purchase of an electronic piano lab, eight pianos would be available for additional practice facilities. The lab itself can also be used as a practice studio provided it is supervised (probably by a graduate assistant or senior piano major) to insure proper care of the instruments. Not only would supervision insure care of the pianos, but the student supervisor could aid beginning piano students with some of the problems they face in learning a new instrument. This could also help the student make the best use of her practice time since the supervised practice would resemble a classroom and would encourage the student to work the full time.

Also, because of limited places available and limited teachers to work in this situation, keyboard ensembles are non-existent. The piano lab would provide adequate facilities for such activities. Since the lab would be used to teach beginning piano,

faculty instructors who would normally assume this responsibility would now be available to work with keyboard ensembles and/or their own performance.

Too often, with the use of conventional instruments, individual needs must be overlooked in order to insure continuity in the class. "With the electronic piano laboratory, individual needs can be resolved in addition to permitting all of the valuable aspects of group instruction."² Most important, however, is the element of time for both student and teacher. The teacher can insure active participation by each student, at her own level, during the entire period of each class. Such total participation is virtually impossible with the use of conventional pianos as each student must be involved in the same activity at the same time. With the electronic lab, individual needs are met through closed circuit without disturbing the other students in the class. Moreover, these needs can be discussed by the instructor with a single student, or even a group of students, through the earphones at the point where the need occurs, thus insuring good learning. An additional advantage is that group activities can take place with only a part of the class while the remainder of the students practice individually or participate in programmed taped lesson.

Recommendations

Before considering what type of lab to purchase for the most effective use, consideration must be given to the question whether a lab is needed. Of the forty two questionnaires returned 57% reported owning an electronic piano lab. Of the 45% not owning a lab, 79% were thinking of investing in a lab in the near future. This indicates that electronic labs are proving successful. At Indiana State University, where two electronic labs are in operation, Helen Harlan says "We could not operate without our two electronic piano labs. They are in use every day and almost every hour from 8:00 to 4:00." Miss Nancy Stephenson, Coordinator of Secondary Piano, North Texas State University, says that "At North Texas we have had fourteen Wurlitzer electronic pianos for the past three years and they have been used eight hours a day, five days a week."³ Even though the above mentioned schools have larger enrollments, effective use by the Music Department of Texas Woman's University could very easily involve the lab from six to eight hours a day.

After deciding to purchase a lab, the important decision is which kind. Wurlitzer electronic labs were used by 41% of the schools reporting to own labs; Baldwin by 12%; Fender-Rhodes by 10%; and P. A. Starck was not listed by any school. From this, it seems that Wurlitzer is the lab chosen most frequently, due probably to the flexibility allowed the teacher through the instructor's console. The Baldwin pianos have the full eighty eight note

keyboard that many piano teachers would prefer. However, the Wurlitzer's sixty four note keyboard has the same "landmarks" as those on a conventional piano (A in the bass, and C in the treble). Whether the keyboard is the same length as a conventional piano should not be important, as the electronic labs are merely teaching tools and not meant to replace the conventional instrument.

There seems to be one disadvantage with the Baldwin labs: the tone is produced by stretched strings as in a conventional piano and it "goes out-of-tune very easily thus making ensemble work almost out of the question."⁴ The Baldwin would, however, sound more like the conventional instrument than the Wurlitzer or Fender-Rhodes labs due to the steel reed tuning mechanisms on the latter two instruments. Miss Stephenson compared the sounds of the pianos in this way: "The Wurlitzer electronic pianos have a little more of an electronic sound than the others, but the sound is pleasant and not the least bit offensive. The electronic pianos that have the string tuning system sound more like a conventional piano, but due to the way the strings are electrically amplified, it is quite harsh to the ear and wears on the nerves quite easily."⁵ In view of the cost and constant inconvenience that might arise with the Baldwin labs because of the string tuning system, and because of the possibility of having to limit ensemble work for the same reason, it would seem wise at this point to recommend either the Wurlitzer or Fender-Rhodes labs.

The number of pianos to be purchased depends upon the ways in which the piano lab is to be used. If the Department plans to use the lab only for teaching beginning piano to music and non-music majors and/or functional piano, twelve pianos would prove sufficient because the Department could limit the class size to twelve. If, however, the lab is to be used in conjunction with theory classes and/or music fundamentals courses for elementary education majors, either more labs will be necessary or the enrollment in these sections will have to be limited to twelve or twenty four students. The Department might purchase one lab of eighteen pianos, or two labs of twelve pianos that could easily serve the needs of all students. In the beginning it might be to the advantage of the Department to invest in twelve student pianos and one instructor's piano until the success of the lab has been determined.

An investment as large as this must prove to be beneficial and a genuine asset to the department. Considering the many ways in which the lab may be used, it may prove to be invaluable. Not only can the lab be used to teach beginning piano and/or functional piano, it can also be used in conjunction with theory classes and with courses in music fundamentals for elementary education majors. Other uses listed by those schools answering the questionnaire were: for classes in piano literature; teaching preparatory school students; piano for pleasure (continuing education for townspeople); individual practice studio; and in teaching piano skills to piano and/or piano pedagogy majors. As was stated above, however, for the lab to prove worthy of the investment it must be used effectively.

In order to use the lab to its greatest potential, someone who is well versed in this type of teaching should be employed. From the twenty five schools reporting that they own piano labs, 41% answered that their lab classes are taught by piano class specialists; 27% said that classes are taught by a regular faculty piano instructor; 14% by the music education instructor; and 17% listed the following: theory staff; graduate assistant in music education; and a teaching assistant under the direction of a specialist. Wanda Martin, Instructor of Group and Class Piano and Piano Pedagogy at the University of Denver, said "For a piano lab and/or group piano class to be effective the instructor MUST be highly trained in the areas of piano, theory, and history--plus group dynamic and other related areas of psychology. Class piano has received a 'bad name' because of unqualified teachers." A person not sure of the correct procedures to use in teaching in the lab situation could be detrimental to the potential value of the lab. "We find that only class piano specialists use the full potential of the lab," says J. Dayton Smith of San Diego State College.

If it is not feasible to employ a class piano specialist, the Department must make certain that only those persons who have a good working knowledge of the fundamentals of teaching piano in groups are placed in charge of the labs. A regular faculty piano instructor could teach the beginning and/or functional classes; the theory staff could use the lab in conjunction with their theory and sight-singing classes; and the music education instructor

in charge of the fundamentals courses for elementary education majors could be in charge of his class in the lab. This could prove to be an excellent working condition and would enhance the value of the lab provided only qualified persons were used as instructors. If it becomes necessary to employ graduate teaching assistants and/or senior piano majors to teach the lab classes, they must certainly be supervised by a regular faculty piano instructor or the person in charge of piano classes.

It must be remembered that the electronic piano was not meant to replace the conventional instrument, and "students reach a point when they must change and study on a piano."⁶ The electronic lab could be used for the first and/or second year of beginning piano and then the students could transfer to a regular piano instructor to work on a conventional instrument. "We use electronic pianos only for the first year of class piano. In the second year, we use real pianos and limit the class size to six."

In view of the information found in chapters two and three, the author would make the following recommendations:

1. The Music Department of Texas Woman's University should purchase an electronic piano lab.
2. Because of the steel reed tuning mechanisms and the flexibility both systems allow the instructor through the instructor's console, the Wurlitzer or Fender-Rhodes labs are recommended.
3. The number of pianos purchased at first should be

limited to twelve student pianos, one teacher's piano, and an instructor's console.

4. Ideally, a class piano specialist should be employed to conduct the lab classes. However, a regular faculty piano instructor could teach the classes in beginning and/or functional piano, the music education instructor could be in charge of his classes of elementary education majors, and the theory staff could conduct their own classes in the lab.

5. If used for no other purpose, the Department should purchase a lab to be used in the fundamentals of music courses for elementary education majors.

6. The Department should use the lab to its greatest potential by employing it in any or all of the following ways: in conjunction with theory classes; teaching beginning piano to music majors; teaching beginning piano to non-music majors; teaching functional piano; in conjunction with the fundamentals of music courses for elementary education majors; and as an individual practice studio with someone (graduate teaching assistant or senior piano major) supervising during the practice sessions.

7. The Department should explore all of the many uses of the electronic lab, especially ensemble work, which in the present situation is too often neglected.

An electronic piano lab could begin to solve many of the now existing problems of scheduling and inadequate numbers of teachers and teaching time in the music department, but should not and can

not be regarded as the final solution. As was quoted from Boal previously, "You can succeed with it only if you do not ask it to do things it cannot."⁷

1. Boal, p. 92.
2. Rast, "Functional Piano For Tomorrow's Educator's," p. 37.
3. Stephenson, Interview, June 15, 1971.
4. Ibid.
5. Ibid.
6. Boal, p. 92.
7. Ibid.

APPENDIX A

LIST OF SCHOOLS * RETURNED QUESTIONNAIRE

*University of Alabama
University, Alabama

*Northern Arizona University
Flagstaff, Arizona

Henderson State College
Arkadelphia, Arkansas

*State College of Arkansas
Conway, Arkansas

*California State College
Fullerton, California

*San Diego State College
San Diego, California

San Jose State College
San Jose, California

*Adams State College
Alamosa, Colorado

*University of Denver
Denver, Colorado

Hartt College of Music
University of West Hartford
West Hartford, Connecticut

Yale University
New Haven, Connecticut

Catholic University of America
Washington, D. C.

*Florida State University
Tallahassee, Florida

*University of Florida
Gainesville, Florida

Georgia College
Milledgeville, Georgia

Truett McConnell College
Cleveland, Georgia

*University of Hawaii
Honolulu, Hawaii

*Bradley University
Peoria, Illinois

*Eastern Illinois University
Charleston, Illinois

Northwestern University
Evanston, Illinois

*Indiana State University
Terre Haute, Indiana

Saint-Mary-of-the-Woods College
Saint-Mary-of-the-Woods, Indiana

*Coe College
Cedar Rapids, Iowa

Luther College
Decorah, Iowa

Wichita State University
Wichita, Iowa

Murray State University
Murray, Kentucky

Western Kentucky University
Bowling Green, Kentucky

*Loyola University
New Orleans, Louisiana

Northwestern State University of Louisiana
Natchitoches, Louisiana

*University of Southwestern Louisiana
Lafayette, Louisiana

University of Maine
Orono, Maine

Western Maryland College
Westminster, Maryland

New England Conservatory
Boston, Massachusetts

*Central Michigan University
Mount Pleasant, Michigan

Northern Michigan University
Marquette, Michigan

*Gustavus Adolphus College
St. Peter, Minnesota

*St. Cloud State College
St. Cloud, Minnesota

*University of Southern Mississippi
Hattiesburg, Mississippi

Lincoln University
Jefferson City, Missouri

*Southwest Missouri State College
Springfield, Missouri

University of Missouri
Kansas City, Missouri

*University of Montana
Missoula, Montana

University of Nebraska
Lincoln, Nebraska

Montclair State College
Upper Montclair, New Hampshire

Eastern New Mexico University
Portales, New Mexico

Appalachian State University
Boone, North Carolina

*Mars Hill College
Mars Hill, North Carolina

St. Andrews Presbyterian College
Larwinburg, North Carolina

North Dakota State University
Fargo, North Dakota

*Manhattan School of Music
New York, New York

*State University College
Fredonia, New York

*Capital University Conservatory of Music
Columbus, Ohio

*Kent State University
Kent, Ohio

*Oberlin College Conservatory of Music
Oberlin, Ohio

*Oklahoma City University
Oklahoma City, Oklahoma

*University of Oklahoma
Norman, Oklahoma

Maryhurst College
Maryhurst, Oregon

Willamette University
Salem, Oregon

*Duquense University
Pittsburg, Pennsylvania

*Marywood College
Scranton, Pennsylvania

Temple University
Philadelphia, Pennsylvania

Barrington College
Barrington, Rhode Island

*Coker College
Hartsville, South Carolina

*University of Southern Carolina
Columbia, South Carolina

*Yankton College
Yankton, South Dakota

George Peabody College for Teachers
Collegedale, Tennessee

Southern Missionary College
Nashville, Tennessee

22
*Union University
Jackson, Tennessee

*Baylor University
Waco, Texas

*Incarnate Word College
San Antonio, Texas

North Texas State University
Denton, Texas

*University of Vermont
Butlington, Vermont

Mary Washington College of the University of Virginia
Fredricksburg, Virginia

*Virginia State College
Petersburg, Virginia

University of Puget Sound
Tacoma, Washington

Whitman College
Walla Walla, Washington

West Virginia Wesleyan College
Buckhannon, West Virginia

Lawrence University
Appleton, Wisconsin

*Wisconsin College-Conservatory of Music
Milwaukee, Wisconsin

*University of Wyoming
Laramie, Wyoming

APPENDIX B

QUESTIONNAIRE

Box 25535, TWU Station
Denton, Texas 76204
June 16, 1971

I am a graduate student at the Texas Woman's University in Denton, Texas, and am in the process of writing my master's thesis. This paper is to be a guide to the selection and use of an electronic piano lab by the department of music at TWU.

As part of my research I am requesting that you fill out the enclosed questionnaire dealing with various aspects of setting up an adequate program with the piano lab.

Would you please answer the questions pertaining to your situation, or pass the questionnaire on to the faculty member in charge of class piano and return it to me by June 25, 1971.

Your time and cooperation is appreciated.

Cordially,

Sharon Prince

Richard R. Bentley,
Associate Professor of Music and
Director of Thesis

QUESTIONNAIRE

1. Does your school own an electronic piano lab?

25 Yes (Proceed to question #2)

19 No (Proceed to question #16)

2. What is the make of your piano lab?

5 Baldwin

4 Fender-Rhodes

0 P. A. Starck

17 Wurlitzer

0 Other (Please list below)

3. How many pianos do you have in your lab?

From 6 to 24.

4. Is the above number sufficient, or would you prefer to have

9 More; Why? How many more? From 2 to 12.

2 Fewer; Why? How many in all? _____

13 Same number as in question #3? Why?

5. In what ways do you use the piano lab?

18 In conjunction with theory classes

21 Teaching beginning piano to music majors

19 Teaching beginning piano to non-music majors

13 In conjunction with courses in music fundamentals for elementary education majors

6 Other (Please list below)

Piano Literature; Preparatory School Students; Piano for
Pleasure; Individual Practice; Piano Skills for Piano and
Piano Pedagogy Majors.

6. Who teaches your piano lab?
- 17 Class piano specialist
 - 11 Regular faculty piano instructor
 - 6 Music education instructor
 - 7 Other (Please list below)

Theory Staff; graduate assistant in music education; teaching assistant under direction of specialist.

7. If lab is used in connection with fundamental courses for elementary education majors, are they taught by
- 3 Class piano specialist
 - 2 Regular faculty piano instructor
 - 12 Music education instructor in charge of course
 - 5 Other (Please list below)

Graduate assistant; student assistant (piano major) supervising practice sessions; theory staff.

8. If lab is used for #7, what areas do you cover and what method book is used?
- 13 Simple accompaniment to a song in an elementary song book
 - 7 Sight reading
 - 5 Transposing
 - 5 Improvising
 - 11 Simple harmonic progressions
 - Other (Please list below)

Method book used: See APPENDIX C

9. If lab is used to teach beginning piano, what areas are covered and what method book is used?
- 19 Playing simple accompaniments
 - 19 Sight reading
 - 14 Transposing
 - 4 Playing an octavo score
 - 3 Playing a condensed orchestra or band score
 - 19 Harmonizing melodies
 - 13 Improvising
 - 3 Other (Please list below)

Repertoire; Technique; Traditional literature by keyboard masters

Method book used: See APPENDIX C

10. If lab is used in teaching beginning piano, how many hours a week does the class spend in the lab.

 $\frac{1}{2}$ hour per week
 2 1 hour per week
 17 2 hours per week
 2 3 hours per week
 2 More Total hours: 5,6 hours per week
 Fewer Total hours: hours per week

11. If lab is used to teach functional piano, what areas are covered and what method book is used?

 15 Playing simple accompaniments
 15 Sight reading
 11 Transposing
 10 Reading chord symbols
 13 Improvising
 2 Other (Please list below)

Repertoire; Scales

Method book used: See APPENDIX C

12. If lab is used in teaching functional piano, how many hours a week does the class spend in the lab?

 $\frac{1}{2}$ hour per week
 1 hour per week Varies 1
 10 2 hours per week
 1 3 hours per week
 More Total hours: hours per week
 Fewer Total hours: hours per week

13. If lab is used in conjunction with theory classes, what areas are covered and what method book is used?

 16 Harmonic progressions
 11 Scales
 8 Transposing
 7 Improvising
 13 Modulation
 2 Other (Please list below)

Realization of figured melody or bass; chromatic harmonies.

Method book used: See APPENDIX C

14. If lab is used in connection with theory classes, how many hours a week does the class spend in the lab?
- ☐ 2 $\frac{1}{2}$ hour per week
☐ 5 1 hour per week
☐ 7 2 hours per week
☐ 3 hours per week
☐ More
☐ Fewer
- Total hours: _____ hours per week
 Total hours: _____ hours per week
15. If lab is used in connection with fundamental courses for elementary education majors, how many hours a week does the class spend in the lab?
- ☐ 1 $\frac{1}{2}$ hour per week
☐ 4 1 hour per week
☐ 3 2 hours per week
☐ 3 hours per week
☐ More
☐ Fewer
- Total hours: _____ hours per week
 Total hours: _____ hours per week
16. What are your reasons for not purchasing an electronic piano lab?
- ☐ 4 Not a sufficient need
☐ 9 Too costly
☐ 4 Not sufficient space
☐ 3 No one to teach in this type of situation
☐ 2 Other (Please list below)
- Purchase one for new building; not convinced that this is
the best method to teach minors.
17. Are you giving any thought to purchasing an electronic piano lab in the future?
- ☐ 15 Yes (Proceed to question #18)
☐ 4 No (Proceed to question #21)
18. What type (types) of lab are you considering?
- ☐ 12 Baldwin
☐ 7 Fender-Rhodes
☐ 2 P. A. Starck
☐ 7 Wurlitzer
☐ Other (Please list below)

19. In what ways do you plan to use the lab?
- 10 In conjunction with theory classes
 - 13 Teaching functional piano
 - 10 Teaching beginning piano to music majors
 - 11 Teaching beginning piano to non-music majors
 - 8 In conjunction with courses in music fundamentals for elementary education majors
 - 3 Other (Please list below)

Piano preparatory; teaching beginning piano to secondary students in applied studies; practice studio.

20. Who will conduct the classes in the piano lab?
- 10 Class piano specialist
 - 8 Regular faculty piano instructor
 - 5 Music education instructor
 - 2 Other (Please list below)

Theory staff; senior piano major as part of piano pedagogy lab.

21. Would you or your school like a copy of the results of this study?
- 34 Yes
 - 3 No

22. If you have any comments or questions regarding the study, questionnaire, or electronic piano labs in general, please use the space below.

SIGNED: _____

POSITION: _____

INSTITUTION: _____

APPENDIX C

METHOD BOOKS

Method books used by the participating schools in the various courses in which the electronic piano lab is employed.

FUNDAMENTAL COURSES FOR ELEMENTARY EDUCATION MAJORS

Adult Book One -- Thompson

Willis Music Company
Cincinnati, Ohio

Oxford Adult Book

Oxford University Press Inc.
200 Madison Avenue
New York, New York 10016

The Collegiate Class Piano Course Swartz

Appleton-Century-Crofts, Inc.
440 Park Avenue

New York, New York

Music for Piano for the Older Beginner -- Pace

Lee Roberts Music Publications, Inc.
G. Schirmer, Inc.
New York, New York

BEGINNING PIANO

Harmonization and Transposition -- Kern

Summy-Birchard Company
Evanston, Illinois 60204

Exploring Keyboard Fundamentals -- Sheftel

Houghton Mifflin Company
Educational Division
110 Tremont Street
Boston, Massachusetts 02107

Beginning Piano for Adults -- Bastien and Bastien

General Words and Music Co., Publishers
525 Busse Highway
Park Ridge, Illinois 60068

Keyboard Musicianship -- Duckworth

Free Press
Orders to: MacMillan Co.
866 3rd Avenue
New York, New York 10022

- Music Essentials -- Pace
 Lee Roberts Music Publications, Inc.
 G. Schirmer, Inc.
 New York, New York
- Basic Musicianship -- Lyke and Hartline
 Stipes Publishing Company
 10-12 Chester Street
 Champaign, Illinois 61820
- Basic Piano for Adults -- Robinson
 Wadsworth Publishing Company, Inc.
 Belmont, California 94002
- Basic Piano for the College Student -- Zimmerman
 William C. Brown Company, Publishers
 135 South Locust
 Dubuque, Iowa 52001
- Oxford Beginner Book for Older Pupils
 Oxford University Press Inc.
 200 Madison Avenue
 New York, New York 10016
- Skills and Drills -- Pace
 Lee Roberts Music Publications, Inc.
 G. Schirmer, Inc.
 New York, New York

FUNCTIONAL PIANO

- Music for Keyboard Harmony -- Melcher and Warch
 Prentice-Hall
 Englewood Cliffs, New Jersey
- Keyboard Musicianship -- Duckworth
 Free Press
 Orders to: MacMillan Company
 866 3rd Avenue
 New York, New York 10022
- Keyboard Skills -- Chastek
 Wadsworth Publishing Company, Inc.
 Belmont, California 94002
- Basic Piano for Adults -- Robinson
 Wadsworth Publishing Company, Inc.
 Belmont, California 94002
- Theory Workbook -- Pace
 Lee Roberts Publications, Inc.
 G. Schirmer, Inc.
 New York, New York
- Basic Essentials for Classroom Teachers -- Pace
 Lee Roberts Publications, Inc.
 G. Schirmer, Inc.
 New York, New York

IN CONJUNCTION WITH THEORY CLASSES

Beginning and Advanced Books -- Ottmann
Prentice-Hall

Englewood Cliffs, New Jersey

Keyboard Harmony -- Scovill
no address available

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INTERVIEW

Stephenson, Nancy J., Coordinator of Secondary Piano,
North Texas State University, June 15, 1971.

QUESTIONNAIRE COMMENTS

Corra, Arthur, Director, School of Music, University of
Oklahoma.

Harlan, Helen, Assistant Professor of Music, Indiana
State University.

Martin, Wanda, Instructor of Group and Class Piano and
Piano Pedagogy, Lamont School of Music, University
of Denver.

Smith, J. Dayton, Chairman, Department of Music, San
Diego State College.