

DOCUMENT RESUME

ED 381 020

FL 022 877

AUTHOR Kitao, Kenji
 TITLE The History of Language Laboratories--Origin and Establishment.
 PUB DATE [95]
 NOTE 22p.
 PUB TYPE Historical Materials (060)

EDRS PRICE MF01/PC01 Plus Postage.
 DESCRIPTORS *Educational History; Educational Innovation; Foreign Countries; *Language Laboratories; Second Language Instruction; *Second Language Learning; Tape Recordings; Television

ABSTRACT

This paper discusses the history of language laboratories. It was Edison's invention of the tin foil phonograph in 1877 that made the first language laboratories possible. It was used for a foreign language class for the first time in 1891. At first, records were mainly used to preserve rare languages, but in the late 1800s and early 1900s, correspondence courses were developed using records. Students listened to records, recorded their own voices speaking the languages, and sent their recordings back to the company for evaluation. The procedures used by these early correspondence schools established methods that were later used in language laboratories. Between 1900 and 1950, equipment became more sophisticated, with the invention and development of tape recorders and television, and schools began establishing language laboratories. Language laboratories were given impetus by funds provided when the National Defense Education Act was passed in 1958. Various language laboratory programs and studies done on their effectiveness are described. Contains 23 references. (Author/JL)

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The History of Language Laboratories
--Origin and Establishment--

Kenji Kitao
Doshisha University
Kyoto, Japan

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Abstract

In this paper, I discussed the history of language laboratories. It was Edison's invention of the tin foil phonograph in 1877 that made the first language laboratories possible. It was used for a foreign language class for the first time in 1891. At first, records were mainly used to preserve rare languages, but in the late 1800s and early 1900s, correspondence courses were developed using records. Students listened to records, recorded their own voices speaking the languages, and sent their recordings back to the company for evaluation. The procedures used by these early correspondence schools established methods that were later used in language laboratories. Between 1900 and 1950, equipment became more sophisticated, with the invention and development of tape recorders and television, and schools began establishing language laboratories. Language laboratories were given impetus by funds provided when the National Defense Education Act was passed in 1958. I also described various language laboratory programs and studies done on their effectiveness.

Introduction

Technology has improved a great deal recently in Japan, and electronic equipment of various kinds is widespread. Such equipment as videotape recorders and personal computers is becoming common for daily use, both in the home and in companies and schools.

Language laboratories have greatly improved and are rapidly becoming more complex and expensive. Students often have tape recorders, headphones, and a microphone in individual booths. Language laboratories also have audiovisual equipment such as videotape recorders, overhead projectors, opaque projectors, and slide and movie projectors.

Videotapes are being replaced by laser disks, and laser disk players can be interfaced with a computer to allow branching. Computers are also used for administration and evaluation. Although language laboratories are well developed and Japanese language laboratory equipment is highly respected internationally, the effectiveness of their use has been questioned by American teachers who observed language laboratories in Japan (McAndrew, 1975).

I discussed how to make language laboratories more effective in "Administration of a Language Laboratory in College" (Kitao, 1979), analyzing studies of language laboratories conducted in the United States. In order to use language laboratories effectively, (1) equipment, (2) teachers, (3) teaching materials, (4) programs, and (5) evaluations have to be considered carefully. The most important factor is that language laboratories be used as frequently as possible. I explained organization, equipment, personnel, routine work, etc., and how these can be used to make the language laboratory function smoothly.

Since writing that paper, I have become interested in how today's

language laboratories were developed. I have studied the history of American language laboratories, because they have contributed the most to language laboratory development world-wide (Freudenstein, 1972; Amano, 1967).

The history of the American language laboratory can be divided into five periods, (1) the beginning period, before World War II, (2) the establishing period, until 1958 when the National Defense Education Act (NDEA), which supplied large amounts of money for education, was passed, (3) the developing period, until the end of the 1960's, (4) the diminishing period, until the end of the 1970's, and (5) the revival period, to the present.

In this paper, I will discuss the first two periods. I hope to find some hints about the future development and improvement of language laboratories. My major resources are NALLD Journal, published by the National Association of Learning Laboratory Directors and The Modern Language Journal, a long-established journal on foreign language instruction.

Origin of Language Laboratories

Language laboratories have been practical since around 1950. However, their origin dates back to Edison's invention of the tin foil phonograph in 1877, from which our deluxe language laboratories with all their complex equipment grew.

The phonograph was originally invented for the preservation and reproduction of sound. The sounds from this first phonograph were difficult to hear and unclear. The use of a tin cylinder was restricted to a limited number of repetitions (Peterson, 1974).

Though the quality of this early phonograph was not good, it was the only method for preserving sounds at the time. It was used to

preserve African, Indian, and Polynesian languages which were becoming extinct (Peterson, 1974).

In 1884, Drs. Zintgraff and Chavanne of Germany recorded a language of an unknown tribe in Congo using this phonograph. It was also used to record languages, songs, and folklores of Passamaquoddy Indians in New England, and to record a language of natives in Hawaii. Professor Money traveled thirty thousand miles to record American and Mexican Indians. Dr. A. L. Kroeber recorded the language and customs of Mojave Indians at the end of the nineteenth century (Peterson, 1974).

Several kinds of phonographs were produced besides Edison's in the 1880's. Therefore, we do not know which phonograph was actually used in the above recordings. Alexander Graham Bell produced a phonograph called Graphophone which uses a cardboard cylinder with wax for a record. This record could be used longer than Edison's. In 1887, Emile Berliner made Gramophone which used a round flat record. This is the ancestor of the record player. In the same year, Edison, who had been concentrating on developing incandescent light, turned his attention again to the phonograph and improved his original invention and made what he called the "Perfected Phonograph." Its quality was good enough to preserve foreign languages, and his original aim was finally achieved (Edison, 1888).

In 1889, plastic records were sold. North American Phonograph sold waxed cylinders (records) for phonographs and graphophones starting in 1890. These records were used with jukeboxes to play music in public places, and they were not for personal use.

J. Walter Fewkes argued that Edison's phonographs were useful for not only for preserving languages that were becoming extinct but also for teaching foreign languages. Though recordings of native speakers would be most useful for non-native speaker teachers, he also argued

that records could be used effectively by native speakers, because students could listen to the recordings over and over (Peterson, 1974).

Edison's phonograph was used in a foreign language class for the first time at the College of Milwaukee in 1891. It was experimented with in French and other foreign language classes, and it was found to be helpful in that, once a teacher had recorded something, the machine did not tire, and students could listen to the records as many times as they wanted (Peterson, 1974).

Until the 1890s, records used soft brown wax, and they could not be copied or used again and again. Edison used special wax to increase the number of times a record could be used, and he succeeded in making 150 copies of one record that was made with this special wax (Koenigsberg, 1969). In 1894, flat round records were sold as well as wax cylinders. In 1900, it became easy to record directly onto flat round records with wax, and this became the origin of today's records.

In the same year, Dr. John E. Gardner of the University of California taught Chinese concurrently in San Francisco and at the University of Pennsylvania, using a wax cylinder which was sent to the latter class. It was reported that the class in Pennsylvania did not have any problems with pronunciation or pitch (Peterson, 1974). Phonographs were considered useful in foreign language instruction in the late nineteenth century, because they could preserve language and play it. It was highly evaluated by teachers in that once something was recorded, it could be used over and over again.

Applications of Phonographs to Foreign Language Instruction

Rafael Diez de la Cortina is thought to be the first teacher to

develop a method for teaching a foreign language using a phonograph. He established a foreign language school in New York in 1882 and experimented with using recordings a great deal in the mid- to late 1880s. The National Phonographic Company was established in 1900, and according to its guide, Cortina was the first person who used a phonograph for foreign language instruction. However, in The Phonogram, an academic journal, the Cortina method was not reported until 1893.

According to Cortina's advertisements, he made materials for self study and for class use. He published several textbooks on French and Spanish. The first one was Spanish in Twenty Lessons. According to his ads, he thought that any material was useful if it was used with the phonograph, but that material specially written for use with the phonograph was more effective.

Cortina gave correspondence courses in which he sent materials and cylinders (records) all over the world, but particularly to South America and Mexico. Students made recordings and sent them back to New York, where they were evaluated and corrected. By 1897, more than a thousand cylinders had been sold. The advertising campaigns emphasized that the recordings could produce sound without tiring. Both French and Spanish cylinders were sold at one dollar per cylinder. Cortina made them at his school at first, though after 1896, they were probably made at Edison's National Phonographic Company. Cortina Phone, the trade mark, was established in 1908, and flat round records were made after 1913. Cortina's courses were used in and out of classes and in overseas correspondence courses. English was used for instruction until around 1920, but after that lessons were produced in which only the target language was used, based on the influence of the Direct Method (Peterson, 1974).

Dr. Richard S. Rosenthal was also influential in the development

of the use of phonographs for foreign language instruction. He became internationally famous with The Meisterschaft System for teaching French and German, and he also published Italian and Spanish courses. He moved to Chicago in 1893, and he published the Rosenthal Method of Practical Linguistry and Physician's German Vademcum.

He thought that it was important to use the eyes and ears at the same time, and he advertised ten books, a cylinder, and a ten-way hearing tube for thirty dollars. He emphasized grammar, in contrast to the Direct Method, and he believed that the learner must listen to the language for a time before attempting to produce it. He published the Language Phone Method, and it became the trade mark of his materials. He made flat round records in 1914, but other than that, his materials did not substantially change since then (Rosenthal, 1941).

The third program to use phonograph records for foreign language instruction is International Correspondence Schools of Scranton in Pennsylvania. They used records for correspondence courses for coal miners. This program was founded by Thomas J. Foster in 1891. Correspondence courses in French, German, and Spanish were offered using a method similar to those used by Cortina and Rosenthal. The International Correspondence Schools had only correspondence courses and sent machines and cylinders to learners and made corrections (Peterson, 1974).

Looking at these three schools, it appears that the principles that would later be used in language laboratories were well established by the late nineteenth or early twentieth century. Their procedure was to have students play model recordings and record their own voices and then have teachers evaluate and correct the students' efforts. They used textbooks along with the recordings. These were the principles of the use of the language laboratories. Through the

1920s and even beyond, these three methods were very popular, and they were even incorporated into university programs.

Development of Machines

Foreign language records became more and more popular and many exaggerated claims were made for them. Some advertisers claimed that a new method of teaching foreign languages was found. This had the effect of casting doubt on language laboratories as a whole, an effect that is still being felt (Freudenstein, 1972).

Equipment became more and more sophisticated after 1920. First, television developed very fast after 1920. J. L. Baird demonstrated it in public in Britain in 1926, and in the following year, it was exhibited in public at the Bell Telephone Laboratory. Experimental telecasting was started in 1929 in Britain, in Germany and France in 1935, and in the United States the following year. However, because of World War II, its development was delayed. Television as we know it today appeared after World War II. Movies were invented in 1894. Eugene Lauste, a Frenchman, invented the "talkie" in 1910, and it became practical, and "Don Fan," the first talkie, was shown in 1926. Radio was invented in 1895 and was often used in foreign language instruction beginning in the 1920s.

The tape recorders also had their origin around this time. Oberin Smith argued for the use of wires to preserve sound in 1888. Valdemar Poulsen of Denmark invented a magnetic recorder with piano wire in 1898. It was called telegraphone. However, both inventions had more problems than advantages, and they did not get much attention (Freudenstein, 1972). In 1928, Fritz Pfleumer obtained a patent for a paper tape with iron powder that could be used to record sounds with a magnet, which is based on the same principle as the recording tape we

use today. In 1934, Bell Company made an endless tape with magnetized iron as an experiment. At the beginning of World War II, the "sound mirror," a tape recorder with a wire that recorded for a minute was developed.

As I have explained, equipment found in language laboratories such as tape recorders, movies, and television were developed in 1920s. They were developed rapidly up to World War II. Radios were especially widespread, and they were used in foreign language instruction. The recording industry also became very popular beginning in the 1920s.

Use of Language Laboratories at School

A teacher named Clarke who used records to teach languages at Yale University for a long time, emphasized four principles related to using records (Freudenstein, 1972).

- 1) Records always play the same model.
- 2) Machines never get tired.
- 3) Machines cannot replace teachers.
- 4) Native speakers of the target language should be used for recordings.

These four principles are valid even in today's language laboratories, and 3) and 4) were new at that time.

We do not know very much about how language laboratories were used in schools in the 1920s. I will discuss two examples, one from Mississippi State College for Women and one from Ohio State University.

The former school recognized language laboratories as not only desirable but also essential for basic language classes. Language classes met four times a week (including once for a language

laboratory) for three credits. They used language laboratories for verb exercises, pronunciation, phonetics, songs, games, explanations of grammar, conversation, memorization, etc., which teachers wanted to do but did not have enough time to do in the classroom.

Language laboratories were administered by student assistants. There were twenty-four students in each language laboratory with an assistant for every seven or eight students who in turn was supervised by the teacher. The language laboratory class met once a week, and the teacher made all the plans for the class. Faculty members checked on whether the assistants were good teachers rather than their work or results. Students studied hard in small groups with an assistant rather than a teacher. They often practiced pronunciation with records, but records were also used for songs, dramas, poems, and fables. Students not only studied how to pronounce sounds correctly but also learned to write pronunciation symbols. Such activities as Stunt Night--a semi-annual event in which students presented such "stunts" as tableaux, dances, songs, skits, and historical sketches--were also very popular. There was also a club for more advanced students (Pierson, 1927).

Ohio State University reported on their language laboratories. They were very practical in nature and useful for teaching. The main purpose of the language laboratories was taking the burden of drills off of the teachers and putting the responsibility on the students.

Language laboratories were established in 1924 or 1925 and used for language classes and classes in phonetics, educational principles, and public speaking. The facilities were poor. Sixteen students sat together at a table with a phonograph with earphones. Students were supervised in their studies using time cards. The language laboratory was open until eleven o'clock at night for students to do homework (Waltz, 1930). The records were eight minutes long and could be used

twenty-five to hundred times. After that, they were sharpened and used for another one hundred times. They each cost about seventy-five cents (Waltz, 1931).

Advantages of language laboratories were thought to be 1) they made it possible to listen to many native speakers, 2) students did not have to hear other students' incorrect pronunciation, 3) they made it possible to listen to the lesson many times and practice, 4) they lightened the teachers' burden of doing drills, 5) they allowed students to prepare for the class enjoyably, 6) they made it possible to test listening and speaking, and 7) lessons could be changed easily by replacing cylinders (Waltz, 1930).

In both colleges, language laboratories were used as extensions of classes; the former with self study and the latter for class administration. These two types of language laboratories are still in use in the United States today.

In the 1920s, the equipment was not good, the quality of the recordings was poor, and the recordings could not be used many times. The limitations of language laboratories were already becoming clear. 1) In the quarter system, students did not have enough time in the language laboratory over the course of the quarter. 2) Students needed to study reading most. 3) Students could not imitate utterances correctly by themselves. 4) Students cheated on the time cards. 5) Students tended to study without the records, since pauses after the utterances were too long, and so using the records was time-consuming. 6) Because of the poor quality of the records, there was a lot of distracting background noise through the earphones. 7) Students without language laboratories showed a greater improvement in their grades (Schneck, 1930).

Waltz (1932) reported on two studies of pronunciation, one which involved teaching Irish dialect to American students and one which

involved teaching articulation to American students. While these were not of foreign language teaching, they may shed light on the use of language laboratories to teach pronunciation in foreign language courses. In both cases, researchers compared the results of working independently in a language laboratory over a period of time (listening, imitating, and using the recorded imitations to check the pronunciation) with instruction and drilling in class. In both cases, the students who worked independently in the language laboratory showed more improvement than the ones who were in the classroom. Waltz concluded that language laboratories have the advantages that they 1) provide a consistent, correct model, which the students can use for practice in privacy, 2) help motivate students, because they can see their progress, 3) frees classroom time for other types of work, and 4) saves the teacher's energy.

Freudenstein (1972) believed that the birth of language laboratories occurred around 1930, and some publications on language laboratories appeared around that time. They were considered to have been accepted and established.

The Establishment of Language Laboratories

Amano (1967) has reported in detail on the development of language laboratories from the end of World War II until the passage of the National Defense Education Act (NDEA) in 1958.

Green Mountain Junior College put into practice the method of the Specialized Army Training Program (SATP) in the classroom for the first time, and this program reflected some of the principles of today's language laboratories. These principles are 1) individualized instruction at each student's level of ability, 2) intensive instruction, 3) training for listening with model speeches on records,

4) developing expressions with repetitions, 5) use of self-made materials with commercial materials, 6) arrangement of materials according to difficulty level, 7) instruction by teachers and assistants throughout the class hour, 8) evaluation of students' levels of proficiency, 9) efforts to increase motivation, and 10) recording the foreign language at the beginning and end of the lesson (Amano, 1967). These principles are still useful for language laboratories today.

Birmingham Southern College in Alabama used a portable phonograph and records and evaluated them highly, saying, "It brings languages to life because it brings life to languages," in 1943 (Whitehouse, 1945: 590).

Johnson (1946) argued that audio-visual materials are necessary to help students achieve linguistic and cultural goals. These materials should be carefully planned, which is important in the process of learning. Students can develop listening ability if they have many opportunities to listen to the target language. Adequate use of records is effective for training, not only for listening but also for speaking. These points were supported by people who wanted to develop language laboratories.

By 1946, the University of Texas, Northwestern, Cornell, Yale, Georgetown, and the University of Florida had language laboratories, and some high schools were also interested in establishing them. In 1946, New York City suggested that city schools also establish language laboratories (Amano, 1967). The University of Louisiana started a language laboratory class in 1946, and Wayne University did the same in 1948 (Ebelke, 1948).

In 1948, 28 junior colleges in the north central states responded to a survey. Nine of them had a recording machine, and five of them reported that it was effective for improving students' pronunciation

(Ornstein & Johnston, 1949). Language laboratories have developed more variety since 1948, and the term language laboratory became the recognized technical term by 1955 (Amano, 1967).

Television and various recording machines were developed after World War II. Records were still important, but during the war, tape recorders with various types of tapes and wires were developed (King, 1967). A tape recorder with wires was used in German classes to record students' voices and critique their pronunciation in 1946, and Scherer (1947) predicted that it would be used widely in high schools and colleges. Magnetic tapes were mass produced starting in 1946 (King, 1967).

Until around 1950, recording machines were sold as dictation machines or for replaying programs at broadcasting companies. Dunkel (1947) believed that recording machines could be used for foreign language teaching.

Around 1950, tape recorders became popular, and new teaching methods using language laboratories were developed. Principles for using them were already understood, but new techniques were what were needed (Freudenstein, 1972). In the 1950s, tape recorders with two tracks were made and students could listen and record at the same time (Freudenstein, 1972). Since 1955, the University of Delaware started a study on using visual aids in language laboratories (Kirch, 1969).

During the war, development of television had been stopped, but it continued after the war, and in 1948, color TV was invented. In 1951, broadcasting of black and white TV was done between the East and West Coasts, and in 1954, color TV was broadcast. In 1953, the first educational TV program was broadcast in Houston (Krymitz, 1971). It is reported that TV was used in a German class in 1955 (Formanek, Clausing, & Wood, 1974).

Video tape was experimented with in 1951 for the first time, and

in 1952, the results of the research was published. In 1953 multiple track color video was developed. In 1956, Appex Company announced the revolving technique, commonly used today, which was good enough for broadcasting at that time.

This equipment was made before the NDEA, but a survey from 1957 to 1958 indicated that only 240 colleges and 54 high schools had language laboratories then (Amano, 1967).

American language laboratories were established before the NDEA, and their use had been carefully considered, but they were relatively few in number, and they had to wait for the NDEA, which gave extensive national support, for expansion.

Conclusions

Language laboratories with their deluxe audiovisual equipment and computers have their origin in the phonograph invented by Edison. At first, phonographs could only preserve sound and replay it, but it later became possible to record sounds and make copies of the recordings easily, and sound could be preserved longer. This set the stage for the use of phonographs in foreign language learning.

Phonographs were used in foreign language instruction, because once recorded, they did not tire, and students could listen to the recordings many times. In correspondence programs, students recorded their own voices while practicing what they had learned, and their efforts were evaluated by teachers. Special materials geared to be used with recorded materials were developed beginning in the late nineteenth century.

Facilities and equipment for language laboratories were developed after 1920. First a recording industry developed for language learning materials, and their exaggerated advertising drew notice.

Television developed after 1920, and then after World War II, and today's television industry was established. Videotape recorders, the forerunners of the ones that have become common today, were developed under the NDEA. Movies with sound became practical by 1920. Radios were used often for foreign language instruction by 1920. Tape recorders, which are the heart of language laboratories, were developed by the 1920s. During World War II, tapes were used, and these developed quickly after the war and were also used under the NDEA.

The use of language laboratories in schools has increased since 1910. The principles that machines could not take the place of teachers and that recordings should be done by native speakers were included in publications before 1920. In the 1920s, language laboratories were used at Mississippi State College for Women and Ohio State University. The two systems of having students use language laboratories under the supervision of a teacher and independently part of the class or as an extension of the class were introduced. In either case, taking some of the burden off the teacher was an important advantage. Drills for pronunciation were the center of the language laboratory curriculum, and songs, games and developing new learning was tried.

Disadvantages of language laboratories became clear. Students did not have enough time in the language laboratory. There were courses to which language laboratories would not contribute much. Some students could not repeat the sounds correctly. Even today, we need to consider these problems in administering language laboratories. Without considering these problems, we cannot expect language laboratories to be effective.

After World War II, language laboratories spread gradually. There were some new trends. They began to be used for purposes other

than foreign language instruction. Students' recordings became more central. Visual materials were used developed. However, there were still many schools without language laboratories, and they had to wait for financial assistance from the NDEA.

By the time the NDEA was passed, there were many publications about value of language laboratories and teaching methods that make optimum use of language laboratories.

It is useful to review how our profession has been influenced by the development of technology, even as we make an effort to use more powerful machines effectively. Many of the principles that were established using simple early devices are still valuable today. However, it is easy to forget these important principles as we work with the more sophisticated modern technology of today.

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This paper was originally published in Japanese, as "Gogaku Laboratory no Rekishi--Tanjō to Teichaku--" (1984) in Doshisha Studies in English, 35, pp. 86-103.