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ABSTRACT

Focusing on the current status of the language laboratory in instructional use, this report stresses the need to employ a systems approach in the selection and operation of laboratory equipment. The author points out the interrelatedness of the key factors in any system, including: (1) people, (2) method, (3) instructional materials, (4) equipment, and (5) facilities. Three basic types of laboratories are described: the "audio-passive" (listen-only mode), "audio-active" (listen-respond mode), and the "audio-active-compare" (listen-respond-record mode). The function of the laboratory is related to design, manufacture, and selection of equipment. Criteria concerning pedagogical, technical, and administrative matters are suggested. A selected bibliography concludes the report. (RL)

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CRITERIA FOR SELECTING TYPES OF FOREIGN-LANGUAGE LABORATORY SYSTEMS

by Joseph C. and June O. Hutchinson

INTRODUCTION

The rapid growth of language laboratories during the 1960's represents a bizarre tale in the annals of foreign-language education and of instructional technology. The rather normal and steady evolution of this innovative medium during the 1950's in colleges and universities was abruptly changed by the sudden availability of federal matching funds for the purchase of language equipment and materials by public secondary schools through the National Defense Education Act of 1958. In spite of warnings from the language-teaching profession not to move too quickly without proper planning, thousands of schools showed their willingness to change, not so much by carefully training teachers in the newer methods and materials, but by purchasing new language laboratory systems. This tangible symbol of innovation and change has been the subject of controversy ever since. Actually, the revolution and reform movements in foreign-language education symbolized by the language laboratory represent a much deeper and older controversy over aims and objectives and methods and materials (14).*

One of the most lucid, complete, balanced, and accurate statements on the state-of-the-art of contemporary language teaching and learning can be found in Wilga Rivers' Teaching Foreign-Language Skills (21). It must be understood that the key to the newer ways of teaching foreign languages is found in the methods and materials rather than in the equipment that makes their application more practical. Teachers are rarely neutral about the language laboratory, even though it, as a medium of instruction, is quite neutral to all humans by amplifying and distributing inferior as well as superior instruction (18). It gives out only what is put into it. It can be ugly or beautiful, demanding or obedient, flexible or inflexible, and hated or loved. It has been sought after as a panacea, the way to cure ailing language programs, or later as a scapegoat, to carry the blame for subsequent problems that it was supposed to cure and could not. The shiny, bright, and glamorous language laboratory has either caught on or has stood unused. In each case it has become a symbol of successful, mediocre, or inferior foreign-language programs, the degree of utilization reflecting the attitudes of teachers and administrators.

The real lesson learned by many, whether overtly or intuitively, is that in dealing with technology it is essential to work through a systems approach (1). Components of an instructional system include people (administrators, teachers, students), methods (audiolingual, fundamental skills, traditional, etc.), instructional materials (texts, tapes, tests, etc.), equipment (language laboratory and other instructional media), and facilities (classrooms, laboratory rooms, studios, repair shops, etc.). The dynamic interaction of these major components determines the various degrees of success in efficiently performing the functions required to accomplish one or more objectives. As student progress indicates

*Numbers in parentheses refer to works listed in the Bibliography.

a need for modification to the system, this feedback must be evaluated and validated if improvements are to result. The purpose of language laboratory equipment should relate directly to specific learning objectives. Otherwise there is insufficient justification to continue its support.

Types of Language-Laboratory Systems

Since it is difficult to define the many variable forms and types of language laboratories, it is perhaps more useful to state the basic concept or essential function: namely, to provide facilities for regular and frequent individualized listening and speaking practice with authentic recorded speech models so that the student can reinforce and consolidate what he has partially learned in class and can prepare himself for subsequent class learning activities. Such equipment must, of course, continue to provide clear and undistorted sound that is above average. Neither the extreme of full-range high-fidelity sound reproduction nor telephone or dictating-machine quality is implied; however, the equipment must remain durable and dependable enough for the rigorous demands of institutional use (11).

There are basically three categories of language laboratory systems with multiple variations in terms of accessories.

LEVEL I "AUDIO-PASSIVE" (LISTEN-ONLY MODE)

This simplest system consists of:

- A. One or more Program Sources, such as tape recorder(s), feeding into
- B. Multiple headphones mounted on desks, tables, strips around wall, individual cubicles, etc.

LEVEL II "AUDIO-ACTIVE" (LISTEN-RESPOND MODE)

This laboratory arrangement includes:

- A. One or more Program Sources in a console with switches feeding into
- B. Multiple headsets, plus student microphone and amplifier to provide an electronically amplified "hear-back" of student responses back into his headset.
- C. Intercom. Level II usually includes a two-way intercom between the instructor or monitor and the student.

LEVEL III "AUDIO-ACTIVE-COMPARE" (LISTEN-RESPOND-RECORD MODE)

The most complete and technically complex laboratory system has:

- A. One or more Program Sources as in Level II;
- B. Multiple Headset/microphone assembly;
- C. Intercom;
- D. Student tape recorder, usually in individual student booth, to record both the program and the student response so that both may be compared during the playback.

Little change has taken place in the basic configurations of language-laboratory equipment design and manufacture during the past ten years. There have, however, been considerable improvements made in technically upgrading such features as audio fidelity, noise reduction, switching, durability, and reliability. The basic recording medium is still magnetic audio-tape with a variety of transport mechanisms, including cartridges and cassettes. There are a variety of innovations designed to meet local problems, including multipurpose booth-desk combinations, wireless systems, remote-control systems, dial access systems, mobile electronic classroom systems, battery-operated components, ceiling-mounted systems, and the like. A recent innovation is an instantaneous self-measuring student response unit called a "responser" that makes recording and comparing of student responses of varying lengths more efficient. Several modes of interaction with a program source are possible but some versions of this device defeat the purpose by not allowing variable lengths of utterances to be recorded. A more exciting feature of these and some remote-control systems is the instantaneous access, retrieval, and controlled repetition of brief segments of the recorded lesson. Thus the search for simple devices that are responsive to the learner continues.

Choosing a Language Laboratory System

In 1960 A. Bruce Gaarder of the U.S. Office of Education (10) indicated that a small number of factors could provide a large number of alternative combinations of language laboratory systems and ways of operating them in terms of local pedagogy, logistics, and budget considerations. It is quite possible to have a number of different laboratory combinations available with the more flexible types of systems within the same language program.

Some Planning Factors to Be Considered

1. Is attendance scheduled?	Yes	No
2. Is attendance checked?	Yes	No
3. Is there supervision (monitoring by instructor)?	Yes	No
4. Are the materials integrated with class?	Yes	No
5. Is attendance compulsory?	Yes	No
6. Is the program controlled by the student?	Yes	No
7. Is there student self-monitoring (audio-active)?	Yes	No
8. Is the student recording checked by the instructor?	Yes	No
9. Is the student recording available at all times?	Yes	No
10. Is the availability of the laboratory unlimited?	Yes	No
11. Are prerecorded tapes required?	Yes	No

The above list points to some of the basic decisions that must be made in selecting an appropriate laboratory system. In most secondary schools, for example, the range of choices is considerably limited as compared to college or university environments. In general, college laboratory programs tend to use a library mode of operation (independent study), whereas secondary schools tend to use class modes (group attendance) because of scheduling problems. However, some colleges also include supervised and monitored group sessions in labs, whereas some high schools have found it useful to add self-study lab periods on a library-type basis. The maturity of students, both in terms of

social behavior as well as level of language study, is obviously an important factor in such considerations. One must be prepared to make concessions that will optimize the learning situation. Opportunities for individualized study should be provided in secondary school planning for language laboratories and for media centers (15).

Among the unresolved issues are the pros and cons of "lock-step" learning versus "individualized learning." In some schools the scheduling of centralized Level III systems has imposed a lock-step problem on group access to the equipment so that relief has been achieved by equipping more classrooms with Level II equipment (electronic classrooms) and at less expense than additional Level III systems. Unfortunately, the factor of economics imposes restraints in many situations regardless of the pedagogical needs.

Another related and unresolved issue is the efficacy of student recording and comparing of responses with a model. Learning variables compound the confusion since some students benefit from recording and playing back while others do not. At least there is general agreement that students would learn to pronounce better if they could learn to evaluate their responses by aural discrimination training (12, 20). It is also felt that long delay in playback comparison is not effective; thus, the attempt to obtain immediate knowledge of results by instantaneous responder or by manual playback after each item instead of after a group of items has become a much sought-after but elusive operation.

Current opinion favors the use of Level III equipment more for its capability to provide the student individualized control of his program than for its record-compare capability. However, some uses of student recording for testing purposes are considered worthwhile. Current professional opinion is also beginning to favor the idea that a great deal of listening training and practice—even for prolonged periods of several weeks—should precede any attempts at speaking (8). Thus, the functions of laboratory equipment may vary with the change in emphasis in learning activities as a course progresses.

Dial access systems are often used where a large number of students need access to a large number of programs during most hours of the day and night, such as on a university campus. This audio, and at times video, retrieval system, because of its high expense and wide applicability, is usually shared with other departments. A system of 400 programs and 500 remote student stations can easily cost as high as half a million dollars. In some systems, the program is activated by the first person to dial in, so that another student dialing the same program a few minutes later would not be able to hear the beginning until the entire lesson cycle is completed. True random access is limited to the number of programs that can be played simultaneously. One solution to overcome such problems consists of ultra high-speed duplicators.

Because of the complexities of dial access systems, it is advisable to study them in considerable depth. As with all language laboratories, it is highly desirable to visit institutions that already have had experience with a type of system in which one may be interested and to speak frankly with the administrative, pedagogical, and technical personnel concerning its advantages and disadvantages. Finally, program-retrieval systems are not really the same as language laboratory systems and should not replace them.

There is some opinion that the small, portable, cassette tape recorder may replace dial access. While cassette recorders are lightweight, inexpensive, and capable of fairly good sound quality, there are still some problems that must be considered: the recording heads may be misaligned by normal handling; the motor is usually small and may not last over a very long period of constant use, although some companies offer quick replacement of such parts. One company is now offering the cassette with a much heavier duty motor along with other features that make it more acceptable for institutional use; however, these features also make it heavier and more expensive.

Pedagogical-Technical-Administrative Criteria

1. Pedagogical Criteria

A. Teaching and Learning Objectives: A language laboratory system is not needed unless the attainment of listening and speaking skills are realistic objectives. The laboratory is more for the use of the student than for the teacher. Integration and coordination of class and laboratory is essential (27). Individualized control of program should be provided. Listening comprehension practice is essential to the development of other skills. If the spoken language is wanted only for enrichment, a language laboratory is no longer necessary; a tape recorder or phonograph should be used in the classroom or library.

B. Teaching Personnel: Teacher readiness by training and by attitude is essential to the success of any laboratory program (17). No matter how perfectly all the technical and administrative criteria are met, this alone will not guarantee a successful program. The less skilled in the foreign language the teachers are, the more need there is for a language laboratory system to provide student practice with authentic native speech models. If teachers are not sympathetic to new methodology, beware!

C. Instructional materials: Materials must be designed for language laboratory use and be integrated and coordinated with class activities (13). Local teachers are not normally able to make such materials, except for supplementary elements. Careful selection of commercial materials is more important than the equipment, for the materials will determine in a large measure the methods to be used. Programmed instruction materials are slow in appearing, and even when available should be carefully evaluated before commitments are made.

D. Testing and Grading Programs: Both programs must back up the achievement in the skills to be learned. Listening and reading comprehension are easier to test than speaking and writing. Much grading of performance is recommended, necessitating adequate monitoring facilities (25, 26). Criterion-referenced testing to determine if specific objectives are being reached by the language program is highly desirable.

E. Class size: This is usually determined by the philosophy and economics of an institution, but the closer to 20 the better. If a 30-position laboratory is ordered because it will fit into a room, the size of classes will usually be increased by economic pressures until every position is filled. U.S. Government intensive language programs keep class size at 4-10 for optimum efficiency.

2. Technical Criteria

A. Reliability: "Down time" (when the equipment is out of service awaiting repair) can ruin a program by causing a lack of confidence in the value of the equipment on the part of students and teachers.

B. Serviceability: If the school does not have qualified technical personnel to maintain the equipment, it is imperative that a service contract or other such arrangement be made with a local technical firm. Sophisticated equipment is especially difficult to maintain away from urban areas.

C. Warranty: The system should be covered for one year. See the Technical Guide for Language Laboratory Facilities by Alfred S. Hayes (11).

D. Performance: Seek out the school that has had experience with a given system and make inquiries. Hire your own technical consultant to protect you.

E. Efficiency: Check out all the pros and cons as they fit your own situation. Do not allow the equipment to dictate what kind of foreign-language program you have.

3. Administrative Criteria

A. Scheduling: The type of laboratory system will influence scheduling. The number of classes using the laboratory may be too many for a single lab system to handle in one day. Flexible scheduling concepts can be useful here. Half-period sessions may be feasible if conditions permit. A 20-minute session per day should be minimal since one session per week may have marginal value (25, 27).

B. Costs: Initial costs can range from a few thousand dollars for a simple system to over \$100,000 for an extremely sophisticated system. However, many schools invest \$15,000-30,000 for various combinations of Level III systems. Accessories and installation costs, as well as spare parts and tools, should be considered. Operating and maintenance costs must be budgeted, whether provided for by school personnel or by service contract. Check the experience of a school with a similar system.

C. Space: Is there a suitable room or rooms? Can you spare a room for this purpose? Is it architecturally suitable in terms of raceways for wiring, noise control, ventilation, etc.? Is it near the language classrooms? It is not wise to base the number of positions solely on the size of the room. Ten percent of the positions may be out for repair at some time so that scheduling of 100 percent capacity is not realistic.

D. Other considerations: Size of classes and types or levels of classes and their relative needs must be considered. The larger the class and the more elementary the level, the greater is the need for laboratory practice, especially under supervision. More mature students in higher level courses can use a lab on a library basis. Other curriculum needs for the use of tape recordings are usually quite different from those related to foreign languages. Electronic classrooms or laboratory systems can be used in junior and senior high schools, provided the proper ingredients mentioned above exist. Someone has to be responsible for looking after a language laboratory system or it will die of neglect. With proper care and devotion, it can be a real asset to a language program.

CONCLUSION

One of the best sources of information on language laboratories today is the National Association of Language Laboratory Directors (James W. Dodge, Executive Secretary, The University of Chicago, Language Laboratory, 1126 East 59th St., Chicago, Ill. 60637) which publishes a quarterly journal(19), and holds regional meetings together with language associations (The Modern Language Association of America, The American Council on the Teaching of Foreign Languages, The Northeast Conference on the Teaching of Foreign Languages) and the NEA Department of Audio-Visual Instruction (now the Association for Educational Communications and Technology). A large language research project in Pennsylvania (22, 23, 24) has recently studied foreign-language programs and uses of language laboratory systems in one hundred secondary schools over the past few years. It may very well be that language laboratories are just not being used effectively in the typical secondary school, but it may also be true that the average foreign-language program in such a setting also leaves much to be desired (16). Various elements of the Pennsylvania project report have been challenged from several points of view (5, 6, 28). It is not clear that such a research design can make a valid comparison of teaching methods with so many variables present. On the other hand, the Pennsylvania study showed what goes on in the typical secondary-school language program. Other research studies on the language laboratory seem to be either inconclusive or to cancel each other out by opposite findings. Yet there are still many vigorous language laboratory programs in schools and colleges throughout the U.S. Unfortunately, too many programs have been unsuccessful for lack of a good systems approach and the necessary motivation to make it work. The laboratory is here to stay for those who understand it and know how to use it effectively.

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