



From Rooms to Environments: Techno-short-sightedness and Language Laboratories

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ABSTRACT

Language laboratories have played a major role in the history of foreign language teaching. However, when regarding their presence in modern post-20th century foreign language teaching and learning, it is difficult to find in the profession a close adherence to the concept of *language laboratory* (Howatt 1984). As a succinct explanation, it has been argued that with the rise of Communicative-based Language Teaching they were neglected and became a useless technology. In this position paper we will discuss the role of language laboratories in retrospective, paying attention to the technology diffusion process which accounted for their initial success, and contributing arguments for a revision of their historical evolution into a new tool for learning and teaching foreign languages.

The notion of *techno-short-sightedness* will be used to describe the process of diffusion and *media* adaptation of the language laboratory technology to the latest language learning paradigms.

The article includes a survey of existing language laboratory technologies as well as a taxonomy based on their functions and information delivery systems.

KEYWORDS: Language laboratory, technology, foreign language teaching and learning, education technology, CALL, paradigm

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1. LANGUAGE LABORATORIES IN RETROSPECTIVE

The American Heritage Dictionary of the English Language, Fourth Edition (2000), defines *laboratory* as a room or building equipped for scientific experimentation or research and, in the next entries, as a place where drugs and chemicals are manufactured; a place for practice and observation. In turn, *language laboratory* is defined as a room designed for learning foreign languages and equipped with tape recorders, videocassette recorders, or computers connected to monitoring devices enabling the instructor to listen and speak to the students individually or as a group.

Despite the publication date of the dictionary, the definition appears dated. This notion of a language laboratory has remained unchallenged for almost four decades since Edward M. Stack's *Language Laboratory and Modern Language Teaching* (1960), the first major academic work on the once pioneering technology, was published. Nonetheless, it is a fact that years before that, the United States Navy in 1943 and Kiddle's work in Michigan in 1949 (Howatt 1984:219) had already paved the way for the common, basic layout of the language laboratories which were to become mainstream in major education institutions in the 60s and which served as the model for the language laboratory of the second half of the 20th century, that is, *the* language laboratory defined above.

The spread of language laboratories ran parallel with the success of the audio-lingual method, which in turn largely derived from Fries's structural approach. This methodological connection was, later on, to win language laboratories a bad reputation. In essence, language laboratories were instrumental in complying with Fries' hierarchical model of applied linguistics (Howatt 1984:267). In this model language laboratories had to perform a crucial, although highly subordinate, role. Linguists were those responsible for the scientific description of languages. Later, applied linguists would take over and start preparing the teaching materials after careful selection, organization and gradation of *structures*. These materials constituted the very essence of the whole process where it was mandatory that they were not altered in any way. It is apparent that the language laboratory performed a very significant role in this practice as it stood out as mediator between teachers and students. Given this state of affairs, it is no wonder that the failures of the audio-lingual methodology soon became associated to the mishaps of language laboratories. After all, machines have not complained so far about the blames we have historically put on them.

Curiously, in the post-nichod era (Richards 2001, Rodgers 2001) this bad reputation lingers on. One still finds some rusty resistance to the somewhat platonic, *de passé* notion of language laboratories. On the University of Duke Language Laboratory webpage we can read the following:

The language labs have come a long way since the early sixties. The equipment was large and cumbersome and would seem prehistoric today. There was only a reel-to-reel tape facility, and the only thing the faculty was able to do was to buy tapes that put the students to sleep with repetitive skills. The cubicles were like kennels, and the students were like Pavlov's dogs. There were house rules-NO TALKING, NO VISITING- and students were not to have fun in the labs. They were to do their drills and get out. The teachers rarely came in.

Using Kenneth Pike's Tagmemics terminology and foundations, it seems to us that the observer/ writer's perspective of the phenomenon is, to say the least, too focused on the particles, that is, on the discrete, individual items which make up the whole picture, forgetting other more complex perspectives such as their interweaving and the *field*, more holistic appraisal of the situation. However biased, it is an interesting excerpt as it encompasses much of the disregard and distaste which language laboratories have produced over decades. The semantic prosody of the whole paragraph is more than negative. Kennels and dogs combine here with descriptive adjectives such as prehistoric, cumbersome and repetitive. The actions portrayed are far from the academic world which is supposed to shape everyday life in universities or higher education centres: buy, put to sleep, have fun and get out. Finally adverb phrases are restrictive in nature. Unfortunately, the picture is too subjective to be reliable in any way. Language laboratory enthusiasts at the time might have written the following:

The equipment is impressive and according to existing standards. Fortunately, we have a reel-to-reel tape which students and teachers can use. What's more, teachers have the chance to select the materials they feel are most appropriate to teach foreign language using the most updated technology. Another interesting feature is that students are isolated and can work at ease in a secluded environment. The room has been designed to facilitate learning and hard work. However, let us face it, technology-shy staff rarely come in.

However zealous this description may be, it would not change a bit the very nature and essence of language laboratories, which brings home to us the importance in any field of human activity of an experienced press agent: the problem with language laboratories at one point might have been the impossibility to separate clearly message from messenger, that is, the audio-lingual methodology from the potential and obvious benefits of a particular technology.

Considering the picture by the people at Duke, one is tempted to think that language laboratories have been a failure. Erben and Bartlett (1997) say they were, put it mildly, unsuccessful in grasping educators' interest. In hindsight, we can see how language laboratories as described by Stack (1960) or Hayes (1968) have failed to become a necessary tool for the teaching of languages, a *must* for teachers and material designers alike. The cassette, for example, has not. Even nowadays when CD prices have dropped drastically, the cassette is still there, demanded by teachers and manufactured by publishers, probably afraid of losing the favour of instructors if they are, all of a sudden, forced into using a CD. As a token of this denial, we can see how Paul Saettler's *The Evolution of American Educational Technology*, a seminal work on educational technology, *de facto* neglects the importance of language laboratories by devoting no more than a paragraph to their existence. So, where did language laboratories get it wrong?

As pointed out above, language laboratories became associated with restrictive teaching practices of the type Davies (1997) has called *battery chicken syndrome*, or the more orthodox *pattern practice* tag. Hayes (1968) is an excellent example of the audio-lingual dogmatism of the 60's:

But recent years have witnessed a shift of emphasis in language teaching and learning (...) This shift of emphasis is paralleled by recent advances in linguistic science and allied fields, which have contributed to a new view of language and language learning (...) Central to this view is the observation that understanding and speaking are to a large extent matters of habit, rather than matters of knowledge. The only known way to form habits is through practice (p. 14).

Stack (1960:3) makes it clear to the readers of his manual that "the only realistic purpose of the language laboratory is to provide a convenient means of hearing and responding to audio-lingual drills". Loud and clear: no room for other ranges of activities. This was just typical at the time. Stack himself, when discussing retracing facilities in language laboratories, mentions the role of machine-teaching technologies as understood in the sixties:

In machine-teaching techniques, it is axiomatic that a student should not advance a step until he has mastered the previous one. Each step is called a frame, and if a student does not succeed in a frame, a teaching machine will automatically provide remedial work (5).

Davies (1997) has stated that language laboratories fell out of favour for three sets of reasons. First, the implementation of language laboratories presented important deficiencies including lack of new ideas, materials and training. Second, the very notion of *control* soon lost its appeal. Finally, affective factors such as user-unfriendly gadgetry and a dehumanised conception of classroom organization may have also contributed to a situation where the costly laboratory was simply not in the agenda of language educators and school managers. But well before this picture, the language laboratory was regarded as a very valuable tool.

II. THE EMERGENCE OF A TECHNOLOGY

Although the term *language laboratory* was coined by Ralph Waltz in 1930 (Hocking 1964), and it had probably been around for a long time before being recorded, such a facility was best known as *phonetics laboratory* until the years that followed World War II. The modern language laboratory was somehow *officially* born in 1946 when labs at Louisiana State University and the University of Laval in Quebec City were set up (Hocking 1964). This coincided with the emergence of the so-called Language Laboratory Movement, which was responsible for the big success that these facilities underwent in the following decades. Much has been written about the rise and fall of the language laboratories in the sixties and the seventies and, very likely, many of the readers of this article will have seen themselves empty classrooms where it is not possible to teach languages within a communicative framework because it was decided to set up a laboratory there. Once, the story was written quite differently. See the following excerpt from Tripp and Roby (2001):

The history of the language laboratory in the first years following the NDEA¹ has been written by Parker (1961), Hocking (1964), and Dickloff (1965). There was an explosion in the number of facilities, thanks to generous federal support: \$76 million in matching funds by 1963 (Dickloff, 1965). By 1962 there were approximately 5,000 installations in secondary schools (Hocking, 1964). Another 1,000 secondary schools had labs by 1964 (Dickloff, 1965). This represents a thousand fold increase in the number of labs at the secondary level from 1958! Most of these were in medium-to-large school

districts (Godfrey, 1967). Although colleges and universities were not eligible for equipment funds under the NDEA, they were caught up in the national enthusiasm for language study, and thus committed their own monies to labs. By 1962 there were 900 labs in higher education (Hocking, 1964). More postsecondary labs were built from 1965 when matching funds became available under Title VI-A of the Higher Education Act (Ek, 1974).

National enthusiasm, funding and a political drive behind. Let us admit that, so far, no other language-related technology has been so straightforwardly supported in any way, except for the Information and Communication Technologies (ICTs) boom in the late nineties. However, leaving politicians and funding aside, there is a question which still appeals the interest of Foreign Language Teaching (FLT) professionals: how can a technology equally motivate and be held off with such intensity? We find that there are two sets of reasons that may tentatively answer the above.

11.1. The Effects of Technology

First, there seems to be a significant consensus over the appeal and positive influence of technology on L2 learning. In this sense, several researchers have pointed out language laboratory technologies as means of enhancing the acquisition of a foreign language (Allen 1960, Chomei & Houlihan 1970, Ely 1984). As an illustration of a wider scope of analysis, in the US Department of Education² Forum one could read the following:

Successful technology-rich environments generate impressive results for students, including improved achievement; higher test scores; improved student attitude, enthusiasm, and engagement; richer classroom content; and improved student retention and job placement rates. Of the hundreds of studies that show positive benefits from the use of technology, two are worth noting for their comprehensiveness. The first, a U.S. Department of Education-funded study of nine technology-rich schools, concluded that the use of technology resulted in educational gains for all students regardless of age, race, parental income, or other characteristics. The second, a 10-year study supported by Apple Computer, Inc.³, concluded that students provided with technology-rich learning environments 'continued to perform well on standardized tests but were also developing a variety of competencies not usually measured. Students explored and represented information dynamically and in many forms; became socially aware and more confident; communicated effectively about complex processes; became independent learners and self-starters; knew their areas of expertise and shared that expertise spontaneously.'

These findings are consistent with both Warshauer's (1996) notion of students' empowering and key motivational aspects regarding foreign language instruction, including (a) the novelty of working with a new medium (Fox 1988), (b) the individualized nature of computer-assisted instruction (Relan 1992), (c) the opportunities for learner control (Hicken et al., 1997; Kinzie et al. 1988; Pollock and Sullivan 1990; Williams 1993), and (d) the opportunities for rapid, frequent non-judgmental feedback (Armour-Thomas et al., 1987; Waldrop 1984; Wu 1992). Additionally, in a 1994 Software Publisher's Association (SPA) study⁴, research showed that:

- Educational technology has a significant positive impact on achievement in all subject areas, across all levels of school, and in regular classrooms as well as those for special-needs students.
- Educational technology has positive effects on student attitudes.

- The degree of effectiveness is influenced by the student population, the instructional design, the teacher's role, how students are grouped, and the levels of student access to technology.
- Technology makes instruction more student-centered, encourages cooperative learning, and stimulates increased teacher/student interaction.
- Positive changes in the learning environment evolve over time and do not occur quickly.

But technology is not always a plus for educators. In the field of computer-mediated instruction, there exist non-supporters of CALL who contend that the impact of technology on students' progress in learning a foreign language is scanty. The fact is that research is inconclusive at some points. In general, research has been focused on the use of particular software programs and the development of skills such as listening or reading. Tchaïcha (1999: 297), just to cite one of these efforts, found that the students in elementary language courses did not benefit a great deal from using certain types of technology separately or in concert with other practice or input. It seems that doubt is a safe territory to stay as far as technology is concerned.

There is no doubt that technology in FLL has sparked an interesting debate in the profession over the uses and benefits of its implementation. Going back to language laboratories, it is easy to recognize McLuhan's famous quotation "Whenever a new medium comes in, it takes its initial content from the old" (McLuhan, 1964, p. 16) in much of the controversy that aroused from the initial implementation of language laboratories. As with video capabilities or the Internet these days, there was, especially in the sixties, a surge of enthusiasm for this new technology, and accordingly unreal expectations were never met and dissatisfaction got in the way. In many ways, it resembles the anxiety-provoking effect that learning a new language poses on a certain group of students. Initially very few are put off but, as negative experiences start to appear, research shows that a third of the students are likely to experience Foreign Language Anxiety.

II.2. Motivations

It is interesting to note that the very reasons that supported the Language Laboratory Movement in the sixties hold true nowadays for the growing interest in ICTs. Let us examine some of the most influential and surely farthest-reaching ideas which endorsed the aforementioned movement.

At the time, it was prestigious for an educational institution to have a language laboratory, not only because technology was implied but, more importantly, because the military used it and promoted it, both intensive and extensively. As a matter of fact, *technology* has a positive flavour which, anthropologically speaking, entails the acquisition and compilation of a body of knowledge available to a society that is of use in (1) fashioning implements, in (2) practicing manual arts and skills, and in (3) extracting or collecting materials. As a matter of fact, language learning could not afford to miss such an opportunity

to explore unfamiliar territories as far as formal instruction was concerned. In this respect, Marqués (2001) has pointed out that society has always pushed educators and institutions towards adaptive-behaviour in changing scenarios.

In the forties, the widespread use of the language laboratory was actually a major breakthrough in technology applications to language learning. This is even more evident when one examines the contents of Stack (1960) and Hayes' (1968) manuals which, at a rough estimate, devote half of their pages to discussing issues related with the very nuts-and-bolts of language laboratory functioning, that is, technology there is envisaged as a group of electronic or digital products and systems alien to the teaching subject matter which, nevertheless, appear as necessary and central to modern language instruction. In point of fact, the magnetic tape and tape recording machines opened new doors to the manipulation of discourse in the language classroom. Notwithstanding, the language laboratory movement became an entire success exactly because new linguistic groundings embraced its application and set the agenda for a pedagogical use of the novel technology.

In Hayes (1968:14-15) we can find the foundations on which the laboratory prestige and good press lay. His sympathetic pro-lab discourse could be split in four different sets of arguments. First, we find the methodological reasoning. Hayes argues that students' individual rate of learning is better approached through language laboratory use, that individual work is more readily available and self-instruction is also a possibility to consider in language laboratory-based curricula. Second, language laboratories were said to increase language learning effectiveness as better assessment of both speaking and listening skills was achieved. In a similar way, language laboratory advocates used to hold that teachers' counselling role was also positively highlighted as technology played up the opportunities for accessing students' performance⁵. Also, it was stressed that language learning effectiveness was increased as students were given the chance to self-measure their own skills. Thirdly, language laboratory systems⁶ in the sixties were proudly signified as being high-tech electro-mechanical devices for teaching modern foreign languages. For that matter, Hayes (1968) devotes a whole chapter to the description of how acoustic phonetics and speech perception studies combine to secure in laboratories better input for students, better sound quality and, more on the verge of naivety, the presence of *native* varieties in the language classroom. Last, and this time probably least, it was stated that non-native teachers could improve their oral proficiency through the use of language laboratories. It seems to us that such a statement was more a product of methodological overindulgence and excitement than an intrinsic feature of technology applications in the FL curriculum.

III. LANGUAGE LABORATORIES TODAY

III.1. What's in a Name?

Despite the attacks and the lack of prestige to which it became associated, the term *language laboratory* is still deep-rooted and widely used by the profession. The research by Duncan (1987), who establishes a clear-cut distinction between language laboratory and

microcomputers. Murphy (1993), Bensoussan (1994), Frankel (1994), Quinn (1994), Vanasco (1994), Myers (1995), Scliwartz (1995), Biemiller (1997), Cornwell (1997), Danaher and Danaher (1998), Burnett (1998) all make use of the label. It is nevertheless true that some of the uses of the term are not merely descriptive. Thus, Hoffmann (1996) uses *language laboratory* to designate a highly restrictive use of technology in FLL and argues that the computer is the best tool available for taking tedious grammar drills out of the classroom while keeping them in the curriculum. Shenouda and Wolfe (1996) prefer to use *electronic language laboratory* while Patrikis (1995) retains the name but introduces computers in the work environment. Sivert and Egbert (1999) prefer to use the term *computer-assisted classroom* to the detriment of the traditional *laboratory* tag. They have a point when analysing the noun-phrase itself. The classroom, they say, implies a place where different kinds of learning can take place and where technology use is subordinated to discovery and understanding (1999:41). However, the terminological jungle is still out there: computer-based laboratory, computer-based learning centre (1999:42), CALL environment (Hanson-Smith 1999), technology-based environment (Hanson-Smith 1991), etc. The American Language Institute at Indiana University of Pennsylvania literally says on their website that a new state-of-the-art language laboratory is used for listening comprehension, while computer assisted language learning is employed as well as other video-based language learning activities⁷.

Hanson-Smith (1991), when describing the CALL environment, draws a taxonomy which includes the self-access laboratory, the computerized instructional classroom and the language development centre. In the definition, some interesting ideas are heir to the time when it was produced- the same as with audio-oral language laboratory methodological development. It is implied that an environment is made for different types of learning, that is, different learning experiences, styles and approaches can all be met in the same physical location. Technology is not a priority in itself. In fact, it could not be otherwise in digital societies where individuals are no longer constrained by technology; rather on the contrary, technology opens up individual and collective possibilities in terms of business, leisure and, of course, education. Further down this argumentation, Sivert and Egbert (1999) hint at students' discovery and understanding as central ingredients for successful technology-based language learning. Put it another way, learning is paramount, teaching is subsidiary. Taking the analogy a bit farther, we could state that in environments learners have become active agents in their own process of language acquisition, whereas in rooms they were actors playing a role they were not aware of or which was imposed.

11.2. A Survey of Existing Language Laboratories Technologies

After the audio-lingual upheaval, traditional language laboratories were doomed to extinction and methodological exile. Notwithstanding, and this is the tenet of this paper, much of the old-favour language laboratory spirit is still valid and present in the very new CALL-based environments. In the following lines, we set out to present an examination of three 21st-century state-of-the-art language laboratory technologies which were selected⁸ following the

opinions of users of the EUROCALL Members distribution list. Later, the implications which derive from their range of language learning possibilities will be discussed.

11.2.1. Artec Electronics and Revox Learning System

Artec Electronics is based in Belgium and has been manufacturing language learning solutions for over forty years. The range of products clearly spans three different technological approaches.

The ATS / L language laboratory system owes much of its design and foundations to the types of language laboratory described by Hayes (1968). The Audio-Active (AA) and the Audio-Active-Comparative (AAC) features are still there, as well as the notion of teacher control. Terminology is familiar too: teacher consoles incorporate a keyboard and a graphic LCD display; students' cassette recorders are in audio booths and allow the recording of their exercises. This is a solely hardware-electronic solution which matches Hayes' system V.

The CATS/1 and CATS/4 multimedia language laboratories are described by the manufacturer as computer-aided training systems that integrate AA and AAC facilities.

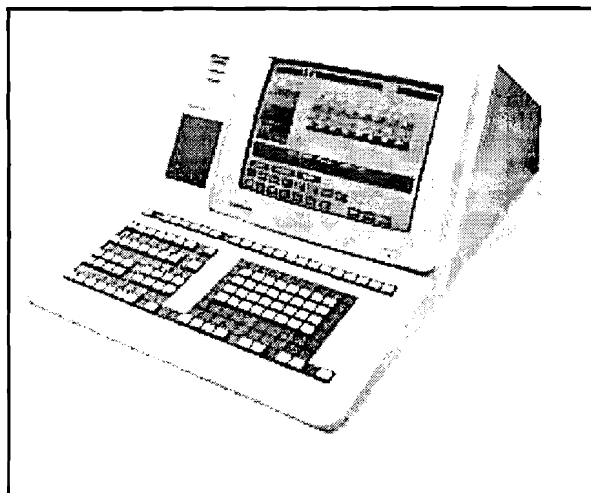


Figure 1: ARTEC CATS/4 Teacher's console

Here video can be transmitted from the teacher's console and can be viewed on the student desk. Programme distribution is available to a maximum of four groups of students whereas ATS/L only allowed this for two. Peripherals and future functions can be added as technology in general, and language learning technology in particular, develops. This is a solely hardware electronic solution which goes beyond Hayes' System V as video distribution and an optional interface for correction with a PC are both available.

AVIDANET didactic multimedia network is described by the manufacturer as a multi-purpose content-learning and learning-enhancing technology. Integration of audio, text and image is its most outstanding hallmark. Terminology starts to be somewhat different: teachers and students sit at workstations sharing digital resources in a network or broadcast. This is a

platform-independent software-hardware solution which runs on an existing computer network.

III.2.2. *Virtual Language Lab for Windows (VLL)*

VLL is manufactured by Keylink Computers Ltd., a company based in England and founded in the early nineties. VLL is a multimedia database application which, exploiting file sharing, recording and retrieval facilities of modern networked PCs, captures and keeps students' performances as long as desired. Real-time monitoring is available and learners can listen to and record their own output. In a similar way, teachers can monitor and access these productions. Intercom and phone facilities are available, both real-time and by voice mail. As long as there exists a networked computer room, VLL is a very affordable, solely software-based solution which covers the most basic needs of standard language laboratories functions.

III.2.3. *Teleste / Divace Learning Solutions*

Based in Finland, Teleste / Divace is one of the leading companies in providing technology-enhanced language learning solutions for over thirty years. As with Artec Electronics, the range of Teleste / Divace products clearly maps different technological approaches. Drawing on Tandberg TC series, Imperata⁹ has been designed for networked computer classrooms where it is necessary to have full control of students' workstations, allowing the use, demonstration and broadcast of software, computer screens and media documents.

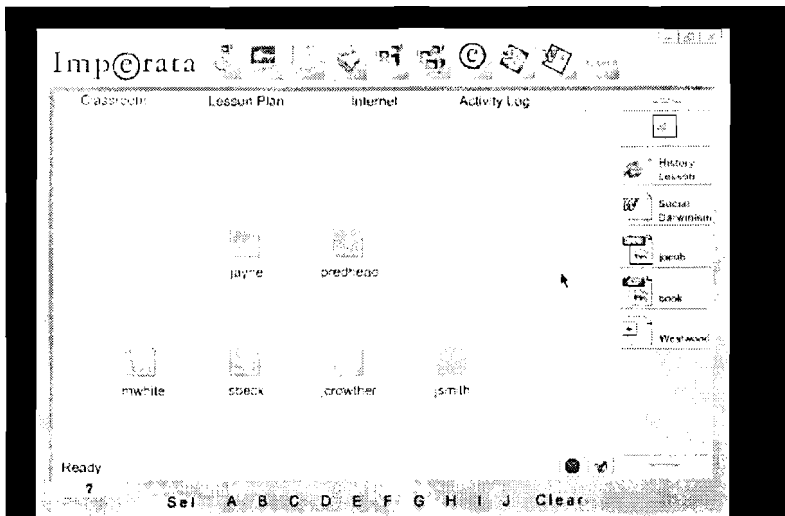


Figure 2: Screenshot from Imperata classroom layout

Grouping and locking of particular workstations is also possible. This is a solely software-solution which is not language learning-specific.

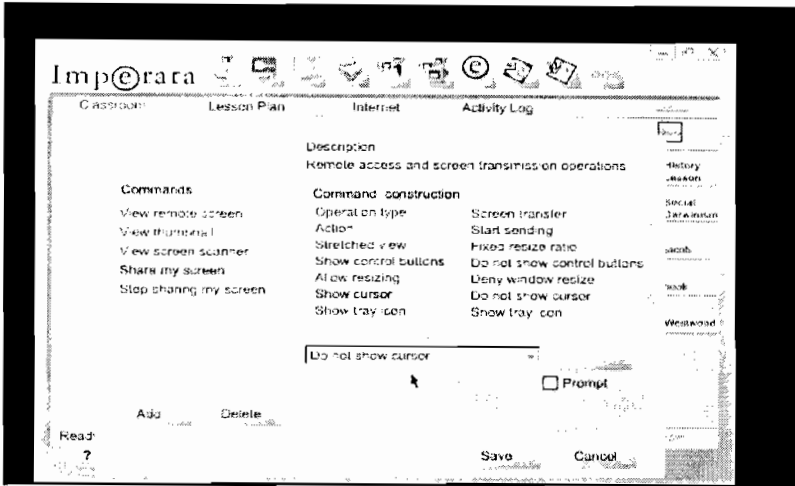


Figure 3: Screenshot from Imperata customisation options

In a recent review by Chris Drage in *The Times Educational Supplement*¹⁰, Imperata was praised for its lesson creation and launching system facilities, as well as for the ease with which lesson portfolios and assignments can be prepared by teachers and for the resources gathering approach. This solution is compared to the classic Viglen's Classlink v3 and the most recent Classlink 2000 network management software which uses a web browser interface to administer either server or workstation files and routines. Again, this is a non-language-specific solution which can be adapted to the needs of language students provided that digital contents become the core for instruction.

The Information and Communication Manager (ICM) Divace Duo Media Centre goes beyond the capabilities of Imperata as it combines a classroom and resource management system with the functionalities of the Divace Duo multimedia recorder. Once again, the key feature of this solution is integration, which enormously facilitates teacher and student different use of learning tools. The benefits of Divace are reviewed in Pérez-Paredes (2000 and 2001).

The Enhanced Language Instruction Centre (ELICE) is a digital teacher-led system which is language-learning specific. The hallmark of this solution is the fact that no computer network is necessary for a lesson to be conducted. This is a software-hardware solution which substitutes students' workstations for a student audio panel. In turn, teachers are provided with specific software, a connection unit, a media storage unit, a teacher audio panel and an audio source interface. The key notion which drives the ELICE rationale is that of session. This allows for the selection of students and groups of students within a class, monitoring features and activity selection that remains constant throughout the traditional lesson. The activities which are supported are listening comprehension, model imitation, read aloud exercise, phone conversation, pair discussion, group discussion, simultaneous interpreting, consecutive interpreting, recorded response and quiz test.

III.2.4. *Language Laboratories Taxonomy*

Based on the description above, we can conclude that the modern language laboratory will invariably fall within one of the following three categories. **Language Laboratory type 1** (LL1) is very much in debt to Hayes' System V. It presents a hardware solution where a networked classroom is not essential and where the main features are teacher-oriented: programme distribution to two groups simultaneously, dynamic assignment of students to different programme groups, conference group, menu driven selection of eight different sources for programme groups, monitoring of a source, not necessarily connected to a programme group, change of input sensitivity for each source, central rewinding for two groups simultaneously, pairing function, group call with full recorder control, general call for all groups, monitoring of students in four different ways (manual, random, step by step, and automatic with time interval), two-way communication with monitored students, with full recorder control, two-way communication with one student during group call, with distribution of the communication to the whole group by using one button, recording of an individual student on one of the source recorders, test and evaluation of student's work, library function, use of macro functions for complex manipulations (such as source selections, copy selections, etc.), on-screen help for most of the functions of the laboratory, copy pause function, recording possibility for teacher and student(s) during pair function or conference function.

Language Laboratory type 2 (LL2) is an evolution of type 1, with integrated computer-aided and enhanced multimedia facilities. It presents a hardware-software solution where a networked classroom is not essential and where the main features are teacher-oriented: monitoring of sources, customisation of most features, simultaneous program distribution on groups, library or free function students, pair work, conference grouping, manual and random choice of students in different group configurations, group call, two-way communication with monitored students, recording of an individual student and test and evaluation of students' work. Virtually every feature of type 1 is found on type 3.

Language Laboratory type 3 (LL3) is a multipurpose solution which generally runs on networked computer environments. A spin-off of this approach does without PCs and relies on hardware, non PC-based devices which are more affordable and portable although less versatile. Language Laboratory type 3 facilitates the integration of Network Based Language Teaching (NBLT) and simultaneous work on different language learning paradigms such as the structural, the cognitive and the sociocognitive (Kern and Warschauer 2000). In general terms, networked language laboratories play up the communication opportunities of students:

Networks connect language learners and language teachers and empower them by expanding and deepening their opportunities for communication in a range of contexts which support the learning and use of language, and which make possible the exchange of ideas on a scale far beyond that imaginable in the traditional classroom (Hoffman: 77).

The following table summarises the typology discussed above.

LANGUAGE LABORATORY TECHNOLOGY ↓	LABORATORY PRODUCTS						
	ATS/L	CATS/4	AVIDANET	VLL	Imperata	DIVACE Duo Media Centre	ELICE
LL 1 Hayes' System V	✓	✓					✓
LL 2 Multimedia computer-aided Hayes' System V		✓	✓			✓	✓
LL3 Networked Computer room			✓	✓	✓	✓	✓

Table 1 Language Laboratories Taxonomy

111.3. Techno-short-sightedness and the Language Laboratory at the Crossroads of Paradigms

From the description of the resources we have presented above, it can be assumed that the newest language laboratories can be defined as more dynamic and expandable than their old *ancestors*, which, as a contrast, could have been defined as being more static and finalized. Manufacturers these days would add that their products are more affordable and within the budgets of most institutions.

Definitely, the rapid developments in ICTs and the widespread use of personal computers have reshaped the perceptions of teachers and students in terms of adaptability to new advances in education technology. At present, language laboratories are more readily updated than ever before. It could not be otherwise. The Internet is constantly distributing new applications which cater for the needs of different groups of students, teachers and institutions. This distributional policy is narrowing the gap between developers and final users in terms of promotion and delivery. Along with this supremacy of the Internet as a worldwide *figurative* operation system (Gabelas-Barroso 2002), software solutions have become or are in the process of becoming a standard in many aspects of language learning, with applications ranging from classroom network management to language practice and communication. As we have seen, LL3 is becoming more widely manufactured by companies aware of the potential and convenience of implemented solutions based on existing or easily-set-up networks, which implies that the language laboratory is moving away from hardware based on electronics and circuitry into PC-based hardware and software solutions.

Despite the novelties, not much has really changed in the new language computer-room environment, and probably for many it might come as a surprise that Hayes' 1968 definition of language laboratory can still be functional in almost any high-tech state-of-the-art language laboratory purchased in the 21st century: "A language laboratory is a classroom or other area containing electronic and mechanical equipment designed and arranged to make foreign-language learning more effective than is usually possible without it" (p.1). Even today

his broad classification of laboratories in class systems and library systems still makes sense as long as you substitute the first for computer room and the second for self-access centre.

It is necessary to understand that the language laboratory, as any technology, has undergone a process of change and adaptation, which has implied arrangements and fine-tuning of the technology as users constantly move forward in terms of performance demands. Unfortunately, more than with other *gadgets* in the FLT field, the profession got the future of language laboratories wrong, ripping up their chances as a long-run technology and misunderstanding their functions and potential. Fidler (1997) has shown how many a technology has been a victim to its supporters and developers alike, as too much pressure and expectations have usually been put on their immediate possibilities. Futuristic views on the potential of language laboratories foretold incredible results in terms of language learning, laying perhaps too much emphasis on the technology and the audio-lingual methodology, but forgetting all too quick the rest of the factors and the complexities of the language learning experience. Possibly the post WW2 era was a time for optimism and joy, but certainly it led the Language Laboratory Movement advocates into simplification and indulgence in the field of FLT.

This has remained in varying for years. One of those futuristic views on learning was portrayed by Jean Marc Cote when in 1899 he was commissioned to depict life in 2000. Cote's picture is quite similar in different ways to learning procedures even nowadays: teacher is in control as students receive information through a technology-enhanced device. Regarding this array of *visions* on radical changes in formal instruction Holmes (1999: 263) has pointed out how the expectations about language laboratories and the early days of CALL have spawned an attitude of disbelief towards technology-driven revolutions in language learning. Again, scepticism if not distrust seen the territory to camp out and spend the night before dawn arrives. And precisely because one of the basic principles underlying language teaching should be effectiveness, one still wonders why language laboratories were not given alternative methodological uses. Rephrased, what was the point of the methodology stubbornness that surely enough played havoc with the language laboratory technology?

Paul Saffo's 30-year rule, quoted by Fidler (1997), may help us understand the ups and downs of the language laboratory through the second half of the 20th century. For him, it takes an average of thirty years for a new idea or technology to permeate societies. In other words, change is a slow process. Although the time span should be considered as an estimate, or at least we do, we are definitely interested in the process which underlies Saffo's rule. For him, the first decade is a stage where excitement, confusion and penetration of the idea or technology combine. The second decade is the stage where the idea or product actually permeates the society, it is a time of movement. The third decade is the last stage, the time when users grow disillusioned precisely because of the spread of the product: *everybody's got it, and so what?* It is just another technology, just that.

The language laboratory technology has been a victim to what Fidler (1997) has called techno-short-sightedness, a process through which the short-term impact of a particular technology is over-estimated, producing frustration among users and supporters who fail to meet the expectations that were created when the technology first appeared. Davies (this

volume) quotes Oppenheimer and stresses the fact that if teachers are neglected not much can be expected from any sort of language learning technology. We would add that teachers were, during the audio-lingual upheaval, methodologically kidnapped as they were forced to make use of the technology in their hands in a very restrictive, unenthusiastic and unimaginative way.

We have already stated that the exact point in time where the language laboratory established itself as a technology could be 1946, according to Hocking (1964). One may tentatively assume that between that year and the publication of Stack 1960 manual, Saffo's first stage developed. In the sixties and the seventies, the language laboratory idea grasped the interest of students and teachers alike, that is, it had a profound effect on society and its use became widespread. The third stage came up with the adoption of the communication-based approach to the learning of foreign languages.

The previous stage-analysis is a language laboratory development survey based entirely on the assumption that the language laboratory appeal is now lost and forgotten, just a dead-end technology. However, the situation is far from being settled. In III.1 we showed that, at least for researchers, the term is alive and kicking, being widely used in the FLT context. More importantly, from the examination of the state-of-the-art language laboratory industry one still gets the idea that in terms of machine-related interaction not much has changed. Hayes' language laboratories systems classification is still recognisable in Artec and Tandberg range of solutions. Hayes' Language laboratory system V (pp. 34 and ff.), the most powerful equipment of the time, was based on listen-respond (Audio-Active), listen-respond-compare, intercommunication and monitoring facilities. Furthermore, Hayes' laboratory teacher's console description (1968) is still valid today: programme source, player, headphones, microphone, amplifier and switches for control and monitoring all are present in modern computer environments. So why is Saffo's 30-year-rule apparently of relatively little use?

The reasons might lie in the fact that a broad concept of language laboratory is still being developed in terms of design and functionalities, which would radically and necessarily redefine the traditional post-communicative-approach approximation to this technology. We are definitely tempted to state that existing language laboratories have adapted the impact of recent communicative based language teaching and the newest socio collaborative paradigms of language teaching, readjusting the gaze and scope of the "old lab" to a more diverse, richer learning environment which equally preserves and incorporates teaching practices.

III.4. Language Laboratories Tomorrow

We have seen how in the past decades the language laboratory has evolved along with educational technology. During this time, perhaps too much stress has been laid on the technological gadgetry and, possibly, too little on related research. Today, we have reached a point where computers are to dominate the education agenda in the future and, accordingly, we can be sure that the road is paved for a digital-based language learning laboratory classroom or environment. Besides, on a much wider perspective, we have the certainty that digital files will be manipulated faster, better and cheaper in the forthcoming years.

The diffusion processes of the existing language laboratory technology, mainly those based on LL2 and LL3, are radically different from those in the 40's and the 50's. Language laboratories today continue to present an *advantage* in formal language learning contexts, as the so-called audio-oral skills are better dealt with in any of the three language laboratories discussed above. Language laboratories are more *compatible* with other non-language specific technologies such as digital contents or wireless technologies (García, this volume) and are more *visible* as computer rooms are ubiquitous in educational institutions. Finally, language laboratories are *less complex* to use these days as ICT literacy is becoming widespread. According to the Computer Industry Almanac¹¹, in 2001 the number of PCs-in-use topped 600M units worldwide. In the next six years this figure will nearly double to over 1.15B PCs-in-use by year-end 2007 for a compound annual growth of 11.4%. The U.S. has the largest number of PCs-in-use with 175M at year-end 2001, but the growth will slow and will increase by only 6.2% per year to reach 251M units in 2007.

All of these are key features for Rogers (1986) who sees in them the seed of a technology true entrenchment. In particular, and within the FLT field, language laboratories are now closer to the teaching profession which can use them to design, develop and implement their own language learning materials, this way freeing themselves from the traditional subjugation and dependence on commercial learning products. But this is just one of the many features which may account for the relevance of language laboratories in FLT today.

Richards (2000) has predicted that some of the next moves in language teaching methodology will include more teacher and student collaboration, more synergy of methods, more focus on content-based methodology, more room for different learning styles, more emphasis on learning strategies, and more stress on holistic learning. In this landscape, the language laboratory is well positioned to perform a leading role in the language learning arena.

Paradoxically, it is precisely on the process of evolution of old audio-lingual laboratories described above that the new environment is likely to offer the best of its contributions. Fidler (1997) has written about mediamorphosis, that is, the transformation of a communication medium, usually caused by the complex interplay of perceived needs, competitive and political pressures, and social and technological innovation. He identifies six principles in mediamorphosis that explain how the first generation of language laboratories have evolved into today's environments: coexistence and co-evolution of media forms, gradual change or metamorphosis of new media forms from old ones, propagation of dominant traits in media forms through languages (spoken, written and digital), survival of media forms and enterprises in a changing environment, merits and needs for adopting new media, and delays from proof of concept to widespread adoption of new media (Saffo's rule). The 21st century language learning environment is inheritor to the phonetics laboratory of the 20th century, keeping most of its flavour and physical layout but transforming radically the concept of language training, moving away from simulated *interactivity* (AA or AAC) to simulated or even human *interaction*. The new language learning environments, which will tend to rely more and more on Language Laboratory type 3 models, have adopted the physical

appearance of old language laboratories, propagating and revitalising traditional laboratory-like modes of teaching within a richer socio-collaborative paradigm (Kern and Warschauer 2000).

Digital language — unlike spoken and written — enables communication between machines, and mediated communication between humans. In digital language human distinctions between text, images and sounds are irrelevant. We are in the earliest stages of such transformations, says Fidler, but we can already see how computer networks using digital language are greatly extending human interactions throughout the world and in the language classroom. These days we communicate quite differently and this fact is to affect how language learning methodology is shaped up. Language laboratories, especially LL2 and LL3, favour the many-to-many, the everyone-to-one and the one-to-everyone forms of communication. We should not forget that the long-standing debate on authenticity in the language classroom has been based on either the practice of pair/ group work in simulated situations or, as Widdowson (1990) has put forward extensively, the practice of communication activities which are authentic in the context of the language classroom. Either way, communication in the 21st century has put new demands on individuals which are well above the standards and realities of the pre-Internet era. The new codes of communication, digital in nature, sustain new mobility networks as well as new social relations based on a global-scale approach with new forms of interaction and new actors. Today's language laboratories have found a way into digitalism (Fukuyama 1992) as it is in the *lab* that more updated, authentic forms of learning and communication take place. The language laboratory, especially LL2 and LL3 types, go beyond the realms of Networked Based Language Teaching or, rephrased, fully extent its potential enabling students to deal with

Spector and Davidsen (2000) have pointed out, very accurately, that all too often educators are quick to enhancing novelties, completely disregarding existing technologies and constraints of different nature and context-related factors. Adopting one single exclusive approach to using technology to support Foreign Language Learning (FLL) implies oversimplifying a complex problem and avoiding a particularly clouded issue. Fortunately, the language laboratory has proven itself a successful long-run technology which has undergone heydays as well as hard times, which has received praise as well as bitter criticism. The language laboratory these days deserves the attention of a teaching profession which is relentlessly bound to meet the demands of a society which relies more and more on both ICT literacy schemes and on an open and flexible learning paradigm far from methodological dogmatism which, historically, has gone hand in hand with the spread of language laboratories in the past. As we know, integration of technologies, which in practice results in methodology selection, is based on either conscious or unconscious choices of teaching resources, participants' roles, materials and educational intentions but, very significantly in our case, on a critical understanding of the language laboratory educational technology evolution into a new tool for learning and teaching foreign languages.

NOTES

1. National Defense Education Act. signed by President Eisenhower on September 2, 1958
2. <http://inet.ed.gov/>
3. <http://www.apple.com/education/>
4. From Educational Leadership Toolkit. A project of the National School Boards Foundation instituted by NSBA's Institute for the Transfer of Technology to Education with a grant from the National Science Foundation. <http://www.nsba.org/sbot/toolkit/>
5. An idea we have recently highlighted as one of the advantages of Network Based Language Teaching paradigms (Pérez-Paredes 2001)
6. Hayes (op.cit.) describes five different language laboratory systems, which range from the very basic Listen-Respond lab with a tape recorder with built-in loudspeakers to the very sophisticated LISTEN-RESPOND-COMPARE with separate recording facilities for students, individual microphone and headphones and intercommunication and monitoring facilities.
7. On the web at http://www.iup.edu/admissions_and_aid/american_language_institute.htm
8. The Learning and Teaching Support Network at the Subject Centre for Languages, Linguistics and Area Studies maintains a website with relevant information on language laboratories. This can be reached at http://www.lang.ltsn.ac.uk/resources/faq_digital.html
- ⁹ The version described here is Imperata 4.0
- ¹⁰ 04/0117003
- ¹¹ On the web at <http://www.c-i-a.com/index.htm> . Press release March 11, 2002.

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