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CALLing for help: researching language learning strategies using help facilities in a web-based multimedia program

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Abstract

This paper summarizes the research described in a PhD thesis (Pujolà, 2000) which presents a description of how learners use the help facilities of a web-based multimedia CALL program, called ImPRESSions, designed to foster second language learners' reading and listening skills and language learning strategies. The study investigates the variation of strategy use in a CALL environment: Twenty two Spanish adult students of English worked with the program in four sessions and their computer movements were digital-video screen recorded. Together with direct observation and retrospective questions a detailed picture of learners' deployment of strategies was drawn. As the emphasis was on the process rather than the product, the description and analysis of the data focus on the observation of the language learning strategies learners deployed when using the help facilities provided: Dictionary, Cultural Notes, Transcript, Subtitles and Play Controls, Feedback and an Experts module specifically designed to provide the language learner training component of the program. The qualitative analysis of the data indicates that many variables have an influence on the amount and quality of the use of the help provided by the program, from the learners' individual differences to the fact that the CALL environment may prompt learners to behave or work in a different way from a more conventional type of learning. The results of the study provide information for future CALL material design and the type of research offers new possibilities for CALL research methods.

1 Introduction: the backdrop of the study

The basis for the study here presented was inspired by Garrett (1995:348):

> "We do not as yet know very much about the extent to which the help and feedback actually contribute to the language development of the average learner. First, there is ample evidence that many, perhaps even most, learners routinely ignore the availability of help materials, even in tasks where we can clearly see that they need them. Second, we do not know when learners do use them, whether that use results in learning (i.e. a change in their knowledge state) or whether it merely helps them over a momentary difficulty, helps them through the task at hand, by providing a bit of information to be used and immediately forgotten again like a number in the

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phone book. It could even be argued that the easier the help is to access, the more likely it is to be used in this almost absentminded way."

In essence the following is an exploratory study of strategy use in relation to the help offered by a web-based CALL program in order to investigate some of the issues raised above by Garrett.

A theoretical framework from three main disciplines of research was firstly proposed as the backdrop of our program and research design and this is shown in Figure 1.

The focus on Second Language Acquisition research was mainly centred on the area of language learning strategies literature (Wenden & Rubin, 1987; O'Malley & Chamot, 1990; Oxford, 1990; McDonough, 1995; Cohen, 1998; to mention but a few) and individual differences and learning style literature (Skehan, 1989; Oxford 1993; Ellis 1994; Reid 1995) which provided us with the necessary theoretical background and the most appropriate research methods for the investigation. Research specific to receptive skills, either reading (Block, 1986; Carrell, 1989; Anderson, 1994) or listening (O'Malley, Chamot & Küpper 1989; Rost & Ross 1991; Goh, 1998), also provided examples for investigating which language learning strategies are used in receptive language tasks.

Regarding Foreign Language Pedagogy attention was directed to theory and research carried out in areas such as:

- General language teaching methodology: communicative approach (Nunan, 1991; McDonough & Shaw, 1993; Widdowson, 1996)
- Autonomy and Self-directed learning (Dickinson 1987, 1992; Little 1991)
- Material and Syllabus design (Nunan 1988,; van Lier 1996)
- The teaching of language learning strategies (Wenden 1995; O'Malley & Chamot, 1990; Oxford, 1996; Cohen 1998)
- The teaching of reading skills (Grellet, 1981; Nuttall 1982; Wallace 1992; Anderson, 1994)
- The teaching of listening skills (Ur, 1984; Anderson & Lynch, 1988; Underwood, 1989; Rost, 1991; White, 1998)
- CALL: material design issues (Stevens 1992; Barnett, 1993; Garrett, 1995; Hubbard, 1996; Seedhouse, 1996)

Special emphasis was also placed on CALL research in the issues particularly determined by the characteristics of this study. Areas such as CALL and learning strategies

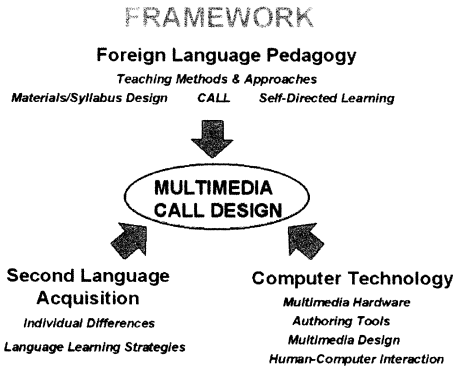


Fig. 1. Multimedia CALL design framework (Pujolà, 1997).

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(Chapelle & Jamieson 1986,1987: Chapelle & Mizuno, 1989; Chapelle 1990, 1994, 1998; and most recently Liou, 2000) exert a marked influence over this study. The work on multimedia CALL and receptive skills summarised by Martínez-Lage (1997) for reading and by Joiner (1997) for listening were the starting point for observing the work carried out on the CALL respective fields. A special mention should be made of the work by Chun & Plass (1997) on multimedia reading comprehension; and other studies on listening and/or viewing comprehension by Brett (1995) and Hoven (1997,1999) The few studies on Help facilities and CALL carried out to date were concerned with ways of how to teach a language by computer and promote the use of learning strategies (Fleissner *et al*., 1991; Fox & Matthews, 1991; Meskill, 1991; Jones, 1992) upon which the general approach here was based. Other research has concentrated on more particular issues such as dictionary consultation (Hulstijn, 1993, 2000; Laufer & Hill 2000), the use of transcript and subtitles (Borras & LaFayette, 1994) and the role of feedback (Robinson, 1991; Nagata 1993,1995; Van der Linden, 1993; Brandl, 1995) which also assisted, in different degrees, with specific details for the program design and for our observation and analysis of the data.

All these studies and research permeated the design of the program and set the pedagogical basis of its construction outlined in the first draft (Pujolà, 1997), having clear implications for the present study since they served as points of reference in the preparation, implementation, and evaluation of the program design and the research methodology employed, and definitely were central to the final success of the study.

Lastly we should not forget the third area of the equation presented in Figure 1– the Computer technology area. From the original idea to its implementation computer technology advanced at a rapid rate which allowed ease of execution but at the same time made it more difficult in the pre-design phase to decide which software best suited the features of the program intended. The program was first envisaged as a multimedia program on a CD-ROM but taking advantage of the growing of the Internet, the title was finally designed using HTML and JavaScript, allowing more flexibility of implementation, delivery and use. The program was designed by the author who taught himself the programming languages using different references available at the time (Neou & Recker, 1997; Neou, 1999; Frentzen & Sobotka, 1998).

The accelerating pace of the technology is consequently a common ground in CALL with several innovations, new products and materials, and therefore new possibilities for design and research. As Levy (1997:44) points out: "amidst all this change, issues such as the role of the teacher and computer in CALL, optimal approaches to authoring, effects of the technology on the methodology, integration and evaluation remain central issues". This study intended to implement optimal CALL design which assisted us in identifying how learners interact with this CALL material.

In the following sections an overview of the program and the study are first presented, and then the help facilities under investigation are described in turn together with a summary of their use by the learners.

2 The program: overview of its design

ImPRESSions is a web-based multimedia title intended for self-study to help learners of English in their comprehension skills regarding news in newspapers, on television and on the radio. It is, therefore, a multimedia program, i.e. video, audio and written text, using multi-media, i.e. TV, radio and newspapers as a source of language input. The final users are learners of English from pre-intermediate to advanced levels. For the research study the prototype targeted Spanish learners.

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The essential structure of the program is determined by the combination of the media since the same news item can be accessed in different media (Figure 2). This reflects the authentic tasks that most people perform in their daily routine regarding news. Not only does this feature provide practice in reading and listening but it also provides support to learners' background knowledge and repetitive exposure to similar language which may improve their comprehension skills.

The organisation of this program allows for a non-sequential educational approach to learning and caters for different individual needs. The materials are organised in a non-linear fashion where the learner can navigate freely through the content of the project, unbound by predetermined routes. Thus they can start reading an article and then move to the radio or the television and do a listening task or vice versa. ImPRESSions is divided into 4 modules: Newspaper, Radio, Television and Experts, the last one being the main language training component where some specific input on reading and listening strategies is also introduced. The program is designed in such a way that encourages the learners to explore and develop their cognitive and metacognitive strategies in the processes of learning a language, in particular those more related to the developing of reading and listening skills. In brief, the design of ImPRESSions encompasses the following main principles:

- is learner-centred
- focuses on learning rather than teaching or testing
- promotes discovery-learning
- promotes autonomy
- develops language learning strategies
- provides authentic texts from several media
- provides a flexible environment to cater for different modes of learning in an attempt to compensate for individual differences.

This application was initially designed for research purposes and runs under the Windows™ operating system using an Internet Browser such as Internet Explorer™. The application has been written in HTML 4.0 for its main structure and content, and in JavaScript for the most interactive features, e.g. exercises and feedback. This would permit the program to be delivered on the Internet. However, for the research study the program was used locally on one computer, although interacting with some Internet resources, as described in section 4.1.

2.1 The media modules: newspaper, radio and television

The structure of the program has been designed to enable learners to control the

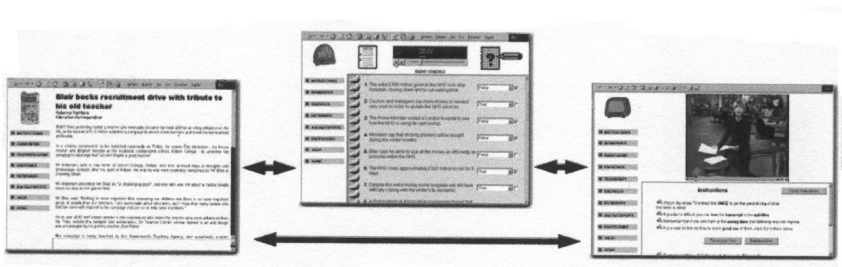


Fig. 2. Combination of media modules.

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management mechanisms in a user-friendly way. Consistency of interface design and navigation tools has been maintained throughout the program. Therefore, the first three modules are organised in the same way.

Once the learner enters one of these modules from the introductory screen, the learner accesses a Contents page which includes a list of news items classified as if it were from a contents section of a newspaper under headings such as Home, Politics, Crime and International. News items were not listed using their headlines but with random letters. The reason behind that decision was related to maintaining authenticity for the first task in which learners in, for instance, the Newspaper module, read the article for gist as if they had opened a newspaper and encountered the item for the first time without any previous knowledge of the news. It is what we call *First Encounter*.

Once the learner chooses one of the items from the Contents page, that particular news item section opens. The screen presented to the learner is then divided into three main areas (Figure 3).

This division of the screen is also consistent in the other two modules, Radio & Television. The left-margin buttons are navigational in nature to move around the different modules of the program and access different help facilities. In addition, control of the navigation can be done by using the navigational buttons and menus of the browser, in our case, Internet Explorer ™. These buttons can handle the necessary functions for learners to control their navigation patterns throughout the program and add functionality, such as access to a printer.

The texts were selected taking into account our research study, as they have special features which are of interest: they include vocabulary that is repeated in various texts to allow repeated exposure, varied expressions, specific aspects of British culture, etc.

A taxonomy of tasks and exercise types was firstly thought out to develop a variety of strategies. However, due to time and technical constraints the implementation of the tasks had to be restricted. The design concentrated on two of the most frequently exploited comprehension tasks where learners can display an array of different strategies in order to perform them, as shown in Table 1.

The exercise types were restricted to those that require minimal free-form learners' output so we are not cognitively overloading learners with their ability in writing skills and can, therefore, concentrate on comprehension. Hence, the software does not need to

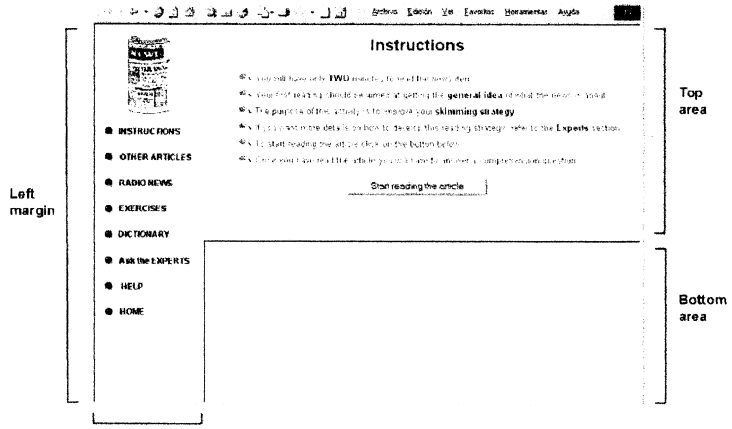


Fig. 3. Sections of the screen in a media module.

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Table 1. *Language tasks*

	SKILL to be developed	Exercise type
Task 1	Reading/listening /watching for gist	Multiple-choice
Task 2	Reading /listening/watching for detailed information	True-False

analyse possible problems of grammar, discourse, type of vocabulary used or typos that learners may make in writing the answer.

The format of the *general comprehension question* is a multiple-choice question with three options. Each option is a statement which summarises the news item. Learners have to choose the statement that most accurately summarises the news item. Once learners have selected an option, they receive 'immediate' feedback. The feedback message is never the Wrong-Try-Again type and provides learners with the reason why the option chosen is not the appropriate one and then tries to help learners to home in on the correct answer.

The first task in each media module involves reading or listening for gist. Aural texts are played once and articles appear on the screen for two minutes only, after which learners answer a general comprehension question. There is, however, no restriction at any point in the program on the number of times a learner may read or listen to the news item to obtain better comprehension or to answers the questions. This freedom for multiple replay is based on enhancing learner differences and the learners' capacity to work at their own pace.

Once the learner has finished with the general comprehension exercise, some instructions on how to approach the *second task* are presented. Before accessing the detailed comprehension exercise learners have to choose between Option A or Option B (see Figure 4). Allowing the learners to make this choice at this point serves several purposes:

- helps them think in their own way of working, and consequently develops metacognitive strategies
- allows for individual differences and learning styles
- allows for individual needs according to how they performed the first task
- allows for experimentation on different ways of working
- puts responsibility on the learner

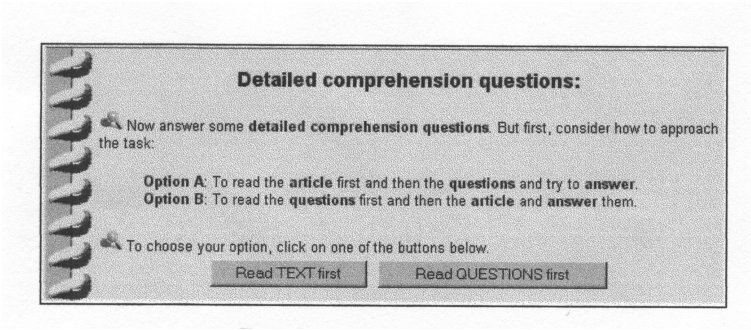


Fig. 4. Instructions (working choice).

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- hands control of the program to the learner
- increases the interactivity between the computer and the learner.

In the design process careful consideration was given over the implementation of the feature of informed choice to the learner. This choice is presented every time there is a change of task within the same item of news, so learners can decide on the way of approaching it. We should stress that either option is considered a valid one. That is to say there is no penalisation in the score and feedback of the second task which could consequently determine the learners' way of working later on. Thus, their choice is entirely free and does not prompt any judgement.

Regarding the *detailed comprehension questions,* the format used is the True-False type, but here another option is incorporated: *Don't know*. This third option allows the learner to recognise that after reading the text and the statement posed by the question they cannot come up with a suitable answer and therefore they will obtain informative feedback on that particular question. This option is incorporated to emphasize to learners that the exercise is not intended as a test but for learning. The nature of the True-False type implies that there is a 50% chance of answering correctly, so the luck factor should be taken into account.

Detailed questions were carefully devised taking into account several aspects that directly determined the comprehension of a written text such as vocabulary, grammar structures or background information. These aspects also determine the way of giving feedback and help to preview learners' source of errors. Once the learner has finished doing the questions, s/he can proceed to click on the feedback button placed at the end of the questions.

So far we have briefly described the Media Modules when learners access them from the main page. As we have mentioned above, the Media Modules are interconnected. Thus, learners can also access another module through other media. If that is the case learners then access directly the same news item as they were working on in the other medium. The idea behind this is that learners now experience what we call *Second Encounter*. This feature is in line with the idea that the second time learners are more prepared, thematically and/or linguistically, to comprehend the new text. Before accessing the related text, a set of instructions is displayed where learners have to decide how to approach the task in a similar way as they do when they have to tackle the Detailed Comprehension Questions as described above. The decision here has the same implications as above in terms of handing control to the learner and the developing of metacognitive strategies.

Once they have decided on their order of working, the task procedure is exactly the same as described for the detailed comprehension questions above. Consistency of work helps to structure the learners' minds and ease their task. The exercise now does not, obviously, involve general comprehension since the learners already know what the news is about, so it focuses on detailed information. This time the detailed questions are aimed at the added information that the new text provides.

2.3 Conceptualisation of help facilities

One of the main features of the program is the provision and design of the help facilities. Help facilities are understood here as the resources of the program which assist the learner in performing a task. The help facilities in ImPRESSions are categorised in two major groups: *Assistance*, those that provide learners with help for comprehension of the text, and *Guidance*, those that are related to the tasks and give help in performing

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them (Table 2). It should be noted that the *Assistance* type also helps in performing the activities since one needs to comprehend the text in order to work on the activities provided. To make a more clear distinction, we could underline that *Assistance* facilities are related to cognitive strategies whereas *Guidance* facilities are more related to metacognitive strategies.

The *Assistance* type are help facilities which are called upon when there is a knowledge limitation and are, therefore, directly related to compensating strategies, i.e. either the learner or the program should compensate for that knowledge limitation.

Different ways of presenting *Assistance* facilities can call for different learning strategies and designers should state clear objectives in terms of what they intend learners to use. For example, the ease of access to the dictionary in a hypertext format could result in or be the result of laziness on the part of the learner who may not even consider trying to infer the meaning of a word and go directly to consult the definition as pointed out by De Ridder (2000). Thus, making the access to the dictionary less accessible may prompt the learner to make more use of compensation strategies such as inferring meaning of words in context. This is the reason why the access to the dictionary in ImPRESSions is not provided in a way where learners access definitions from a highlighted word on the text in a hypertext format. However, when considering cultural information, our approach is completely different. If learners lack some background information, it is more difficult for them to compensate for that knowledge limitation. Thus, hypertext links to *Cultural Notes* have been provided in a way that learners can easily access such information if required, as explained in section 4.2.

Within the *Guidance* facilities, the *Operational* ones are intrinsic to any software design, e.g. instructions, program information, user's guides to some technical features. However, it is in the way they are envisaged that may help to activate metacognitive strategies. For instance, introducing the purpose of the task and advice to perform it in the instructions help learners to, at least, become aware of the 'know-how' of the task.

Table 2. *Help facilities framework (Pujolà, 2000; 2001)*

Assistance Help for Comprehension	• Dictionary • Cultural notes • Transcript • Subtitles • Replaying and Rewinding controls • Feedback: Explanations
Guidance Help for Tasks	OPERATIONAL: • Information on how to use the program • User's guides for the radio & TV consoles • Instructions LANGUAGE LEARNER TRAINING: • Instructions: purpose and/or advice provided • Experts module: reading & listening strategies • Information on how to make appropriate use of Transcript and Subtitles

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The rest of the *Guidance* facilities referred to as the learner training component of ImPRESSions differ from the *Assistance* facilities in that consulting them may not be exclusively prompted by lack of knowledge.

3 The study

The theoretical principles that underpinned the design of the computer program undoubtedly also have an influence on the kind of research design proposed. This does not imply, however, that the purpose of the study is to refute a theoretical aspect. On the contrary, this study is in line with what is described as *grounded theory*: deriving the theory from data rather than collecting data with the aim of supporting or refuting a theory (Nunan, 1992; Strauss & Corbin, 1998). The fact that we still do not know exactly what is going on when learners work on CALL program(s) determines that the type of research that investigates causal effects sensibly needs to be carried out after we have a clear picture of the process. As a consequence, empirical, descriptive exploratory work is essential as a first step in CALL research. The approach followed in this study is what Chapelle, Jamieson & Park (1996:39) describe as *pedagogically-motivated interaction analysis*: "the researcher investigates how learners use software which is hypothesized to have instructional benefits". The main research question is:

- How do learners make use of the help facilities of the CALL program described?

Subquestions:

- Do learners use the help facilities in the intended way of the program design?
- Do learners use the language learning strategies that the program supports in relation to the use and non-use of the help facilities?

This study investigates variation of strategy use, in particular the use of help facilities, in terms of level, according to the Institute for Applied Language Studies (IALS) – University of Edinburgh placement test battery; and of perceived learning strategy use, according to the SILL Questionnaire (Oxford, 1990). The help facilities include:

- Dictionary
- Cultural Notes
- Transcript / Subtitles and Rewind Controls
- Feedback
- Experts

The 22 participants of the present study were Spanish adult learners of English attending the 4th and 5th level of the Escola Oficial d'Idiomes 2, Barcelona, who volunteered to participate in the project. The available time to carry out the study encompassed six weeks. For the study, all students worked on both reading and listening skills using the different media as follows:

- Session 1: Newspaper then Radio
- Session 2: Radio then Newspaper
- Session 3: Newspaper then TV
- Session 4: TV then Newspaper

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Sessions lasted from 90–105 minutes, including the retrospective questions after each text. Table 3 is a summary of the data-collection methods that were used in this study and the data intended to be obtained.

Of all the methods we would like to emphasize the Screen Video-Recording as fundamental due to its accuracy in the recording the process of studying. Information such as frequency of access, mode of access, order of actions, are most valuable in order to draw some conclusions and to try to define patterns of behaviour. Screen video-recording provides accurate information about what the learners *actually* do. The software used for that purpose is Lotus' ScreenCam for Windows' 95. ScreenCam is a PC video facility to create, manage, view and share PC movies, mainly used for presentations, product demonstrations and tutorials for company training programs.

As this software is not specifically designed for the purpose intended here, some limitations were evaluated in the trial phase. ScreenCam was not compatible when the Windows' Media Player was playing video, supposedly due to the computer video-card not coping with both applications at the same time. Furthermore, it interferes with the use of subtitles since it distorts the synchronisation with the audio. Thus screen video-recording was not available for the Television tasks or was stopped when learners used subtitles. We relied on Observation and audio-recordings to collect that information

4 The help facilities and their use

In this section the help facilities under investigation will be briefly described and a summary of some results[1] with relevant examples will be also provided.

The statistical analysis of the data revealed that there was no correlation between the SILL and linguistic level and the use of any of the help facilities. The multiple reasons for that lack of correlation are detailed in Pujolà (2000) but we can underline here possible factors: relatively small number of participants, wide range of learning styles in the sample, misunderstanding of SILL items, multiple variables interacting difficult to pinpoint, etc.

4.1 Dictionary

The dictionary facility can be accessed at all times within the three media modules. By clicking on the button displayed an independent window pops up as illustrated in Figure 5. This window can be moved and resized to the learners' liking. Access to four dictionaries available on the Internet is displayed, two monolingual and two bilingual: English-Spanish. The dictionaries selected were the following:

- WWWebster Dictionary
- Newbury House Online Dictionary
- Langenscheidt's Dictionary
- VOX: English-Spanish

Incorporating online dictionaries entails anticipating problems in terms of accessibility.

[1] It should be noted that for space constraints in this paper the data described in this section is just a small sample of what it is further developed in Pujolà (2000) so the reader can have a general overview of the study.

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Table 3. *Data-collection methods (Pujolà, 2000)*

	Method	Data obtained
Independent variables	IALS Placement test: CLOZE & Dictation listening test	data on linguistic level
	SILL Questionnaire	data on frequency of perceived strategy use
Dependent variables	Computer tracking by video recording of screen: Lotus Screencam™	data on what learners actually did
	Audio Recording – Tape-recorder	data on what learners say while doing the task or in the retrospective questions and to determine what exactly listened to when doing listening tasks
	Observation	data on what learners did as back up for computer crashes
	Interview	data on perceived strategies immediately after performance.
Other	Personal Information Questionnaire	data on learners' personal information: age, gender, etc.
	Evaluation Questionnaire	data on learners' impressions about their experience of the sessions and evaluation of ImPRESSions.

Access can be a real problem depending on the time of the day the learner is using the program, a factor to take into account in our research study in that this can well be a reason for not using the dictionary at some points, which makes learners resort to inferring strategies instead. As a result, we are indirectly promoting the use of learning strategies and we thought this was an aspect worth investigating. We did, however, provide two dictionaries under each category, monolingual or bilingual, so learners can access another one in case they cannot download the one selected first, in order to reduce learners' frustration. Another aspect considered in terms of operational mechanics of the dictionary was that once one dictionary homepage is downloaded, learners can minimise the *Dictionary* window so they do not have to download the dictionary every time they want to look up a word. This makes access to definitions of words easier and faster. Alternatively learners can open another dictionary window from the original one and have two dictionaries running at the same time in different windows. Therefore, either way learners can have easy access to the dictionary at any time during a session of work and from any section they are at in the program.

The extensive description of the use of dictionary for each student shows the following information:

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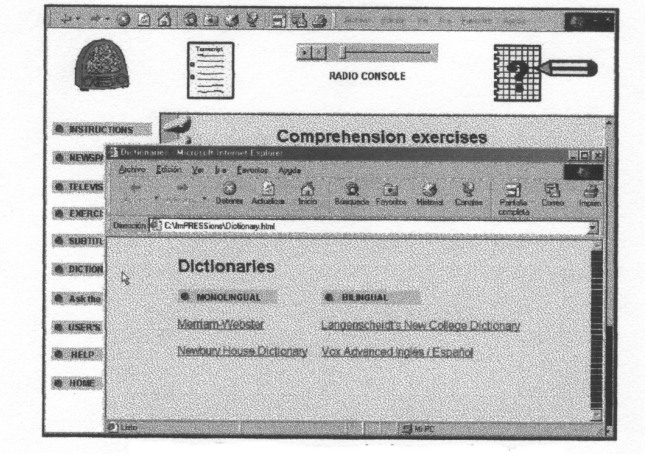


Fig. 5. Dictionary window: main page.

- Word looked up
- Where students encountered the word
- Relevancy of the word for answering the questions
- When students accessed the dictionary
- Which dictionary they used: monolingual, bilingual or both
- When students checked the definition
- If they read the whole entry
- If they checked the context
- The definition that students chose
- Why they looked up the word
- What students did after looking up the word
- Technical Problems encountered
- Other information provided when doing the task or in the retrospective questions.

The analysis of these points in qualitative terms is quite extensive so the following discussion will be centred on only a few of the multiple aspects examined in Pujolà (2000).

The data of *Dictionary* use, as far as reading the articles is concerned, reveal two main approaches to when students accessed the dictionary to look up words. *Pattern A* is when students looked up the words when they encountered them on an individual basis, which also includes looking up two or three words consecutively if they belong to the same paragraph. Table 4 follows an example of the behaviour of student A, in session 3 when she was reading paragraph 4 of the article:

Pattern A basically was performed in two ways. The common one was that students read the whole sentence or paragraph containing the unknown word(s) and then looked them up in the dictionary. But it was also observed that some learners went to the dictionary to look up words without having finished reading the sentence or the paragraph. This reaction to go to the dictionary directly is a reflection of what happens when learners go directly to find support without considering other possibilities. It resembles 'a panic attack' reaction to not knowing and the learner wants to soothe that stress by using the dictionary immediately.

All the students basically followed *Pattern A* when reading the article, with the exception of student C who in sessions 2, 3 and 4 approached the look-up task following

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Table 4. *Description of on-screen and off-screen actions by student A looking up a word: tackle. Data taken from the digitized-video screen recordings, audio recordings and observation*

	ON SCREEN	OFF SCREEN
	[…]	
	∇ moves mouse to p4	∇ reads tx p4
	∇ no mouse movement	St: *...I'm going to look up the definition of a word,...*
D	∇ clicks dict from taskbar	St: *..I think it's one thing and maybe it's another*
	⇒ dict. window pops up (Newbury House Dictionary – def. of *hail* page New Search: Begin Search)	
	∇ types *tackle* in New Search textarea	
	∇ clicks Begin Search button & Si button	T: *what do you think it is?*
		St: *Ah…, hold on, that I forgot the context*
	∇ minimises dict. window [tx: 1-5 / qs:1-4]	
	∇ moves mouse to p4 & over *tackle*	St: *...well,... I don't know now...*
	∇ clicks dict from taskbar	
	⇒ dict. window pops up (Newbury House Dictionary – def. of *tackle* already downloaded)	
	∇ scrolls def. down	
	[tackle *n.* **1.** [U], equipment used in sport: *We take fishing tackle on camping trips.* **2.** [C] (in US football) knocking a player carrying the ball to the ground. *–v.* **–led, -ling, -les 1** (in Us football) to knock a ball carrier down: *A guard tackled the ball carrier.* **2** *fig.* To begin a job with a lot of energy: *I tackled the problem of lowering the company's costs.*]	
	∇ no mouse movement	∇ reads def.
		∇ jots down [→ *knocking a player carrying the ball to the ground*] next to previous annotation [*to tackle*]
	∇ minimises dict. window [tx: 1-5 / qs:1-4]	
	∇ goes to qs	
	∇ scrolls qs down (2-5)	
	∇ no mouse movement	∇ reads q2 (checking her answer)
		∇ reads tx
		∇ reads q3
		∇ reads p2
	[…]	

Pattern B. *Pattern B*, is when students read the text, jotted down some words and then looked them up in one go, one after the other, and then kept on doing the task.

Another relevant aspect to consider about when the students accessed the Internet dictionary is the fact that there could be a gap between the access of the dictionary (Figure 6a) and the actual consultation of the entry (Figure 6b). This feature is specific to Internet dictionaries and thus students showed different strategies in dealing with that issue.

If the definition downloaded immediately or after a few seconds, students usually checked the definition after it had downloaded. The problem was when students were waiting for the dictionary or a definition to download, and the dictionary was not responding or it was taking too long to send the reply. Most students minimised the dictionary window and continued working on the task. Some waited a certain amount of time. Other students were less patient and when they thought the Internet dictionary was not operating to their liking they immediately changed the dictionary to another one which they considered faster.

One obvious problem of that gap between beginning the word search and checking the definition is that the student's mind should have the ability to cope with the task of going back and forward in the reading process or the task process and in their thinking process as well. In that sense that lapse of time allowed student A thinking-time to retry using inferring strategies. Some learners, over the 4 sessions, even developed the strategy of immediately minimising the dictionary window after they had clicked the *Search* or *Look up* button in order to economise on time of interruption and to keep on working, checking the dictionary from time to time.

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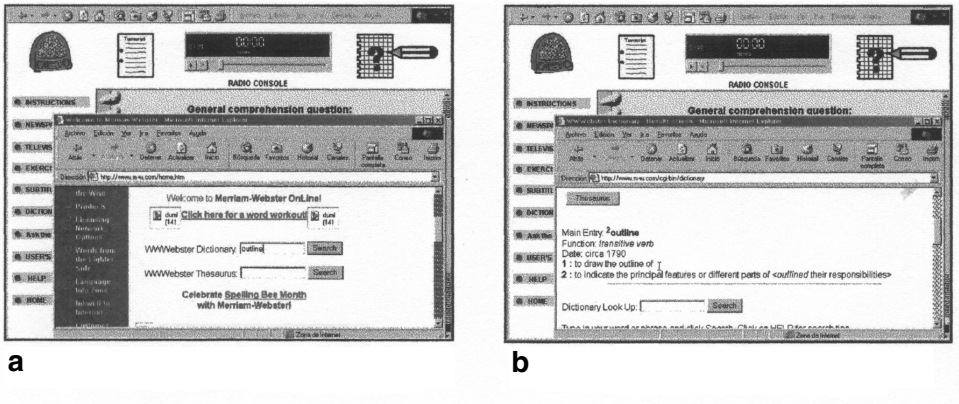


Fig. 6. (a) Dictionary homepage, (b) consultation of entry.

In some cases it was not a question of coping with the task of going back and forward in the reading process but the interruptions that this Internet feature caused in the flow of their working or thinking. Students had to keep reminding themselves that the dictionary was still searching for the word requested. Thus students had to check it, sometimes many times, to find out if the definition had downloaded. Forgetting that the dictionary was searching for a word was also a repeated feature for various students. Internet dictionaries are helpful in that they do the search for us but the particular feature of the delayed response can cause problems. Students should develop a different set of skills to take as much advantage as possible of this potential drawback.

We observed that students displayed a variety of dictionary skills either in general terms or Internet specific. Students behaved differently depending on many interactive factors: computing skills, general dictionary skills, linguistic level, style of working, time of day, tiredness, amount of time spent in the session, etc.

From the retrospective questions Table 5 illustrates the compensation strategies students reported using instead of looking words up in the dictionary. The number of times students reported using them is indicated to see which strategies students used more often and if they were successful in their guesses.

Using the context is the inferring strategy most frequently reported. However, the most surprising feature of these figures is that although most students were successful in guessing words from the context, there is a large number of instances when they did not manage to guess them. This obviously calls for reflection, in that learners use that strategy sometimes thinking that they are successfully interpreting the word but in reality they are not and do not check or confirm their guesses. Obviously most of the time several inferring strategies occurred at the same time or in combination, or interacted in some way. This is not shown in Table 5 where the reported strategies were tallied separately. For instance, even some students who stated that they skipped words, always tried to somehow guess the word from the context or at least tried to obtain the general meaning of the paragraph where the words were, even if they did not consciously apply any inferring strategies. Students mostly reported skipping words when they thought the words were not relevant for their understanding. However, in some cases the skipped words were not only relevant for understanding the text but also directly related to the questions. The retrospective interview allowed students in some cases to be aware of why they did not succeed. We identified that sometimes learners were oblivious to the fact that their strategy was not successful in terms of guessing the meaning of the word.

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Table 5. *Inferring strategies*

Inferring strategies	Managed to guess it	Didn't manage to guess it	Total
Context	116	106	222
Similarity to L1 (Catalan or Spanish)	24	18	42
Analysis of parts of the word	20	19	39
Relating word to previous news item in same session	18	1	19
Previous knowledge of word with other meaning	7	10	17
Analyse grammatical function of word or grammar of sentence	3	5	8
Similarity to English word	0	8	8
Background knowledge	4	3	7
Relating it to news item of previous session	2	1	3
Similarity to another foreign language	1	1	2
Punctuation	2	0	2
Pronunciation of word	1	0	1
Skipped / omitted / avoided		145	

In general terms, students reported a rich variety of inferring strategies, some of them succeeded in their guessing and some did not. What matters as designers and teachers is to provide an environment where learners can use and develop those strategies. In that respect the decision not to include definitions by hypertext links may have prompted learners to use a wider range of strategies than might have been the case if students had had highlighted words to definitions.

4.2 Cultural notes

Cultural Notes (CNs) are included in the written texts of the news items, both the newspaper article and the radio and TV transcripts. In the article and the radio transcript, the Cultural note is displayed on the left margin when the learner places the mouse over one of the links. The CNs disappear when the mouse is placed off the link and the left-margin buttons are displayed again (see Figure 7) The main features of the Cultural notes are:

- Ease of access: learners only have to place the mouse over the link – clicking is not necessary.
- Free access: learners may or may not choose to consult a note.
- To provide information that learners are presumed to lack in terms of socio-cultural information which is directly or indirectly related to better comprehension

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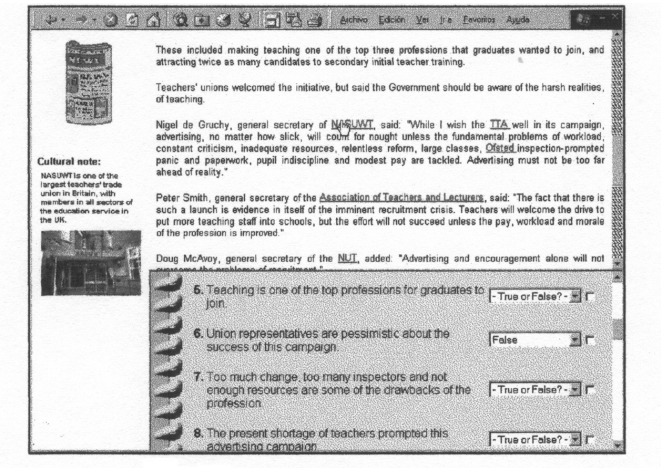


Fig. 7. Cultural Note (left margin).

of the text, and which could be difficult to find in the dictionaries provided. Links include names of people and places, abbreviations and acronyms of organisations and other relevant culture-specific concepts.

- CNs differ in length depending on the aspect they describe. Some extend their information beyond the actual need for comprehending the text, others simply provide the precise information to solve learners' background knowledge limitations.
- Most CNs include a graphic element, either a photo or a drawing, in order to attract learners' attention to the note and to provide a visual element which may assist some learners to associate the concept with the image.

In the texts used for the research study, we specifically introduced some aspects in order to investigate which CNs learners consult, which they don't consult or consult less and where they might need information but a cultural note was not present.

CNs directly relate to the background knowledge of the students on the topics presented in the news items and thus their consultation was determined by the individual needs of each student. After observing the learners I had the impression that students who consult more CNs also look up a greater number of words in the dictionary. Thus we correlated the number of times each learner consulted the cultural notes and each student's total of dictionary look-ups. There is a slight positive correlation of 0.377 ($a = 0.08$), which could suggest that students who used the dictionary a lot also consulted the cultural notes a lot. Therefore, this slight correlation seems to reveal that there were students who were 'compulsive consultors' and wanted to know as much detail as possible about the news item, such as students B and G, and students who tended to consult less and were content with a more global understanding, such as students R, S and H. However, students E and M consulted nearly all the cultural notes in the four sessions although the former was an average frequency user of the dictionary and the latter a low frequency user. This consultation behaviour is, therefore, closely related to students' approach to the tasks or their particular learning styles.

Students mainly consulted the CNs in the newspaper articles and only a few did from the radio or television transcripts. On account of this, we basically concentrate our description and discussion on CNs from the newspapers. In general terms, from the data retrieved from the retrospective interview we can assert that students consulted CNs depending on their

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individual needs and liking or interest, thus it is difficult to pinpoint a reason for consulting a particular CN. Some students perceived some of the CNs as helpful information to understand the text, others because they were simply related to the questions. Other students checked CNs to confirm and others consulted them for sheer interest or curiosity. The majority of the students, though, perceived most of the CNs as extra information which complemented the text and to read them was not strictly necessary for the understanding of the texts. Reasons given by students for not consulting the notes were:

- Some students did not need them either to understand the text or to answer the questions.
- Some had already consulted them in the radio or television transcripts.
- Student Q in session 1, for instance, did not consult any since he did not realise that the CNs were there.

Mainly two types of students have been identified according to their approach in CNs consultation. The first type, labelled the 'compulsive consultors', consulted all of the CNs. The second type, the 'selectors' had a more selective approach in their CN consultation. Generally *selectors* seemed to be more aware of learning strategies and were more conscious of the structure of the text.

From the screen video recording and the direct observation we notice that students followed some sort of pattern regarding when they consulted the CNs. We observed that students consulted the CNs with the procedures shown in Table 6.

The procedure followed most often was the first one: when students encountered the CN without finishing reading the sentence or paragraph. It is surprising to note that students followed that procedure in which their flow of reading was broken by the CN consultation, having to restart reading the sentence. This fact reveals that hypertext links may incite learners to consult them. Further investigation, however, should be carried out taking the two conditions into account, one marked and the other unmarked, to postulate and confirm that this is the case.

When they were doing the exercise students tended to consult the CN prompted by the question, which was the second most frequently used procedure. Of course, after reading the question they went back to the text and reread a paragraph and therefore they consulted the CN in there. However, sometimes after reading the question they went directly to read the CN and then read the paragraph or sentence in order to answer the question.

Consulting a CN did not necessarily entail that they read the whole of the information. That was clearly manifested in the observation, by the amount of time some students spent in reading some of the long CNs, and corroborated in the retrospective questions. Partial reading was related to the issue of reading the CNs fast, perhaps in order not to break the flow of reading too much. Repeated consultation was also caused by skim reading the CNs too quickly and by other factors: some students misread the information the first time, or read only some part of it, or needed more details for the question or simply forgot what the CN was about.

The CNs produced some sort of positive effect at different levels. They sometimes prompted students to relate the foreign socio-political situation to their own. CNs, in general, received a positive response from the learners' point of view since ease of access and their visual element caught the learners' attention.

4.3 Transcript, subtitles and replay controls

Both the transcript and the subtitles have the same purpose, and thus it could be more

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Table 6. *CN consultation procedures*

When students consulted CNs	Example of an identified instance
• when they encountered the CNs without finishing the sentence, while reading	Session 2: student K reads all the notes of the text when he encounters them and keeps on reading.
• when they finished reading the sentence or paragraph of the CN(s)	Session 2: student R after reading paragraph 12 consulted CN: Release.
• when they finished reading a chunk of text (two or three more paragraphs)	Session 1: student I after reading half of the text, goes back directly to top and consults CN: NHS.
• before they read some extract (a paragraph or chunk) of text in detail	Session 4: student B scrolls down text while reading and before starting to read paragraph consults CNs: NASUWT, TTA, Ofstead, Association of Teachers and Lecturers, one after the other then starts reading p11.
• when they finished reading the whole text and consulted some randomly or one after the other.	Session 2: student J after having finished reading the whole text consults CN soft drugs and checks Home Office.
• when they read a question and went directly the note	Session 1: After reading question 1 to student A goes directly to consult CN: MoD.
• while waiting for definition of dictionary to download	Session 2: student G while waiting for definition of brothels to download consults CN soft drugs.

cost-effective to include only one. They are, however, both incorporated in the program in keeping with the principles of individual differences: different modes of obtaining aural decoding help.

The misuse of these facilities can prevent the development of listening strategies and thus prompt the contrary effect to that intended. Careful consideration was given to the design of these facilities. Firstly, emphasis was placed on introducing a *Guidance* element in order to draw learners' attention to the need for care in using the transcript and/or subtitles. And secondly, the access to those facilities was carefully designed. With regard to the transcript, in the Radio module it is displayed in the bottom area of the screen where the questions are also displayed (Figure 8a), so learners cannot have the questions and transcript at the same time. This feature avoids the temptation of having the questions and the transcript at the same time which would practise reading instead of the intended listening strategies.

The subtitles have a peculiarity in ImPRESSions: they are not *automatically* synchronised with the images. Learners have to click on a Start button immediately after they have clicked on the Play button. Subtitles then start to show as if someone was typing the audio track. It really depends on the user to obtain adequate synchronisation. For instance, if learners want to stop the track, they have to stop the subtitles, but then it implies losing the achieved synchronisation.

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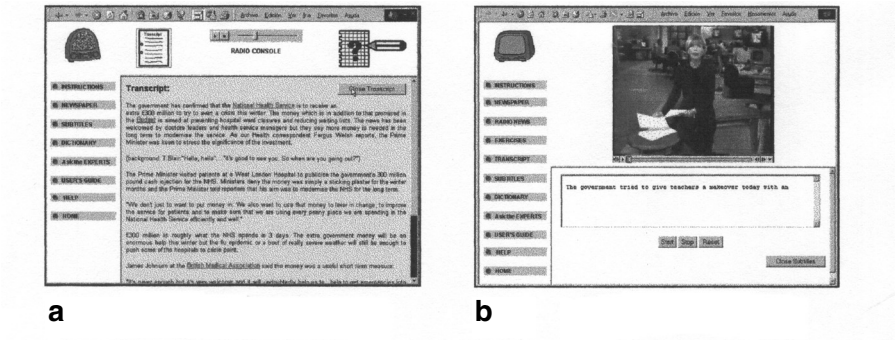


Fig. 8. (a) Transcript, and (b) subtitles.

Transcript, Subtitles and Replay controls, which include play, pause, rewind and fast-forward buttons, are help facilities to assist learners in their decoding of the aural input. The use of the decoding help facilities rarely occurred in isolation since in most cases students needed to at least use the replay buttons to perform their listening task. Commonly, then, the extra decoding help mostly comes from the transcript or the subtitles and thus we basically focus our discussion on the use of these two facilities, but, of course, we also consider them in relation to the replay and rewind functions.

From a language teacher's perspective it seems logical to think that students who are poorer decoders (according to the listening test) would rely more on visual decoding help, such as the transcript and/or subtitles, when doing the task, and that higher decoders would use those facilities less often because they are more able to follow, in our case, authentic aural input. Considering the decoding level of students in groups, we observed that students within each group behaved in varied, idiosyncratic ways regarding which decoding help was used most often.

Higher Decoders (HD), tended to use the *replay* and *rewind/pause* procedures more rather than the transcript and/or the subtitles. Average Decoders (AD) also seemed to rely on the decoding facilities of *replay* and *rewind/pause*, although the instances of using the transcript and subtitles was higher and more prominent than the HDs. With regard to Lower Decoders (LD), the prominence and frequency of transcript and subtitles use was higher than the ADs and the HDs. Only one student, however, never used them while doing the exercises. At the lowest decoding level, the Poorer Decoders (PD) could be divided into two groups: two students never used the visual scaffolding of the transcript and the subtitles, whereas the remaining two based their listening comprehension work on them, sometimes as if they were doing a reading task instead of listening.

In general terms, the hypothesis that higher decoders may use the transcript and subtitles less frequently and the poorer decoders more is not always the case in our sample. Although there seems to be a trend, there are other reasons which surely influenced this diversity of approaches within each group. In all the above groups there are students who never used the transcript and the subtitles and there are also students who used them substantially more than the rest of the group. Furthermore, in each group with the exception of the HDs there are students who are used to the visual support and without the transcript or the subtitles they feel at a loss. Probably the difference between the groups in our sample, then, lies in their perceptions of the purpose of the transcript and the subtitles. In the two higher level groups students tended, in

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general, to perceive and use them more as a backup to their listening activity, whereas the other two groups considered them as a more necessary tool in their understanding of the authentic aural input. However, we cannot postulate that this is always the case. From the summarised data illustrated in various tables in Pujolà (2000) and data from the retrospective questions we could propose that the linguistic level may have had some influence, but the perceptions and beliefs students had about how a listening task should be performed, the way learners approached the task, their individual learning styles and their feelings towards a listening task in general also had a decisive influence.

Preference for the subtitles over the transcript is an issue which is closely related to the issue of 'reading temptation'. As Student A in session 1 mentioned:

> "I thought that between the transcript and the subtitles, better choose the latter. I prefer them, instead of having all the text,…because I have the temptation of reading the text. So, I chose the subtitles. At least, I do some listening…try to listen to it and if not (*meaning not catching the words*)…look at the subtitles".

The reading temptation comes naturally from the fact that students once they accessed the transcript while doing the listening activity had the whole text to overcome the stress of not understanding.

In general, students did not feel so guilty about using the subtitles while doing the exercise since they had the impression that they were at least doing a listening activity. In the majority of cases the transcript was reserved for more particular aspects, e.g. to check the spelling of a particular word in order to look it up in the dictionary. Some students, however, used it while working on the question with the result that they were actually doing a reading activity rather than a listening one. One of the factors that influenced the students' use of the transcript in that 'unintended' way from the designer's point of view, was that students reacted due to the common I-don't-understand-anything syndrome causing some sort of 'panic attack' where they were unaware of the drawbacks of using the transcript in that way. They usually wanted to solve the problem, thus the subtitles or the transcript were the effective vaccines to immunise against this kind of attack.

Regarding the *rewind/pause* facilities we noticed mainly two types of students. Students who paused and rewound moderately, particularly at moments when they did not catch some information, re-accessed longer units or simply preferred to replay everything without much rewinding, as in the case of student D. In contrast, students who are classified as 'compulsive rewinders', such as B, C, G and T in all four sessions, were rewinding many times to catch as much detail as possible. In those cases, smaller units were preferred to that of longer chunks. We should point out that there are other students who also rewound many times, but it was only at a particular instance in one of the sessions. Interestingly, the four students identified above were also part of the *compulsive consultors* group since they looked up a higher number of words and consulted a higher number of cultural notes.

4.4 Feedback

There are two ways of providing feedback in ImPRESSions, which are dependent on the type of task. Thus for Task 1, the multiple choice for general understanding of the text, learners receive *immediate feedback* in a *text area* below the question. This was chosen as the most appropriate way of offering feedback since learners can quickly decide on their next action after reading the feedback, either read the text again or immediately select another option if, for instance, they have doubts between two

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options. The feedback message is never the Wrong-Try-Again type and provides learners with the reason why the option chosen is not the appropriate one then tries to help learners to focus onto the correct answer. Learners may select all the options until they manage to get the most accurate one, as they are not penalised or awarded a score.

As for task 2, the feedback mechanics of the detailed comprehension questions allow for what we call the 'delayed two-step feedback'. In other words, students click the *Feedback* button and obtain the results and which questions are correct and which are incorrect, and then they have to click the *Explanations-of-the-wrong-answers* button down in the middle of the page to obtain that information. This two-step mechanism provides certain flexibility to adapt to different approaches of self-assessment allowing for delayed feedback. To find out about the actual wrong answers the learner should go back to the Questions area on the same page and look at the boxes next to the answers. From here learners may decide to find out by themselves the source of errors by contrasting question, answer and text, or may scroll down to the Evaluation area and click on the Explanations-of-the-wrong-answers button. Explanations are not visible to learners until they specifically choose to click on the button. Explanations are not provided for the correct answers since learners' attention may be dispersed and not focus on where they have a lack of comprehension. Students responded to the immediate feedback in three different ways. They:

- re-accessed the text again before trying another option
- chose another option straight away
- thought about the alternative and chose it

It was noticed that when they obtained the correct answer, most students skim read the feedback message quickly or simply read the *That's correct* message, without paying much attention to the sentence explaining why that option was the right one. In contrast, all the students that accessed all the options read the message for the correct answer.

As far as the delayed feedback is concerned the most common procedure was for learners to go directly to see the Explanations after seeing which answers were incorrect. Thus after reading the explanation students scrolled up to the corresponding question to read it. Students alternated between reading the explanation and the question, scrolling up and down trying to understand where they made the error.

When learners decided to find the source of errors by themselves before the program provided that information we observed two different approaches in our study:

The first one is how student E performed in session 3 television where after having read the results and identified the incorrect answers he proceeded to listen to the whole TV news item while reading the transcript. He then continued to read the explanations of the two incorrect answers and commented that he had managed to find out the explanation of one of the two by himself.

The second approach is similar to the first one but is characterised by a more detailed exploratory nature: for example student L, after having seen which were the incorrect answers, proceeded to watch the TV news item with the transcript while having the question with those incorrect answers visible on the screen. Therefore, he watched the TV news item following the transcript until the point which the question referred to, paused the video and analysed where the error for his answer was, alternating between transcript and question.

For a more detailed account of this help facility refer to Pujolà (2001b) where a paper presented in EUROCALL 2000 describes fully the rationale of the design and the use by the students in the study.

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4.5 Experts module

The Experts module is probably the most explicit learner training element of the program. It provides information on strategies involved in listening and reading and advice on how to improve those skills. The main purpose of the module is to develop learners' metacognitive knowledge regarding strategies for comprehension.

The format of this information was carefully planned in the design process. The first decision was to take advantage of the multimedia capabilities of the computer and thus the video format was thought to be ideal for that purpose. Experience tells us that most learners pay more attention to tutors' advice in class rather than reading it from handouts or textbooks. Hence, the video feature adds a human aspect to the computer-learner interaction and enhances affective and motivational aspects. The result is that learners can watch a tutor responding to a question posed by them.

Two experienced English teachers and teacher trainers from the Institute for Applied Language Studies at the University of Edinburgh, Mrs Sheena Davies and Dr. Tony Lynch accepted the proposal. Their answers to the questions (see Table 7 and Figure 9) were video recorded and later digitised to include them in the program. Both teachers had the questions in advance to structure and prepare their responses but they were asked not to read any pre-written scripts to keep their comments as natural and spontaneous as possible. Moreover, they did not know each other's answers so we could increase the authenticity of their response. Thus in the end product some answers deal with the same points, which adds a reinforcement aspect that learners usually need, and some are approached from different perspectives, which improves the variety of strategies introduced.

The Experts module can be accessed from the main page or from the other three modules by clicking on the ASK-THE-EXPERTS button located on the left margin (as seen

Table 7. *Experts' questions*

Reading Comprehension
1. What can I do when I do not know a word?
2. How can I guess the meaning of a word?
3. When can I use skimming?
4. How can I improve skimming?
5. When can I use scanning?
6. How can I improve scanning?
7. What can I do when unfamiliar information is given?
8. How can I improve my reading?
Listening Comprehension
1. What can I do when I do not catch a word?
2. What can I do when I do not understand a word?
3. What can I do when I comprehend less than 50%?
4. What can I do when I cannot follow the speed of the speaker?
5. What can I do when the speaker has a strong or unfamiliar accent?
6. What can I do when I hear too much unfamiliar information?
7. How can I improve listening to the news on the radio?
8. How can I improve listening to the news on television?

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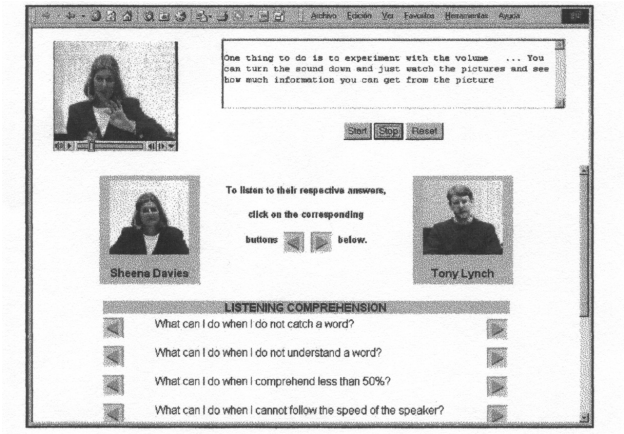


Fig. 9. Experts module: listening comprehension section.

in Figure 3). In this way, learners have the choice of either starting a session by consulting the Experts or doing so whenever they feel appropriate within the other modules.

Seventeen students at some point in the four sessions consulted the Experts, thus 5 students never accessed that help. Some of the reasons for not consulting were due to time constraints or that they did not feel the need or see the point in referring to them. Several students reported the time factor, and some replied that if they had had the program at home, they may have consulted this module more times. The fact that sessions lasted 90–105 minutes was too short a time for some students, as they devoted much of this time to working conscientiously on the comprehension tasks. The time factor and the constraints imposed by the experimental study may have had a direct influence on the frequency of Experts' consultation.

The question most frequently consulted for the listening strategies was question 4 which refers to what can be done when students cannot follow the speed of the speaker. This issue was one of the major concerns for some students in the sample. Student M, for instance, tried to compensate and solve the problem of speed by pausing at various points so it allowed her thinking time to try to decode what was said. She chose that strategy although she thought that it was cheating a little bit since in reality you cannot do that. She never consulted the Experts who could have provided her with some other tips to overcome that problem.

Regarding the reading strategies questions it seems logical that questions 3 and 4 had the highest consultation since the instructions of the newspaper article directed the students to refer to the Experts in case they did not know the meaning of skimming. The Experts module was interesting for the majority of the students. For some it was useful as they managed to obtain some information they were not aware of, but for some more strategically knowledgeable students this module was not useful or was even unnecessary.

5 Conclusion and implications for further research

This study shows an overview of how the students in our sample used ImPRESSions and its help facilities. We can certainly affirm that the program caters for individual differences since it adapted to the high variability of our sample. The key issue is that the

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flexibility provided by the program permitted learners to suit their own needs taking into account both their learning styles and their particular learning strategies at the moment the study was undertaken. It also allowed them to experiment with new possibilities raising their awareness of strategic knowledge, either by using the assistance facilities or the guidance components presented.

Two major patterns of behaviour were identified in the study: a global approach to tasks and thus a less frequent use of help facilities where the students relied more on their knowledge and strategies, including avoiding strategies, and the approach followed by the *compulsive consultors* who repeatedly consulted or made use of the help facilities to gain details of the texts. We found a minor correlation between the amount of dictionary look-ups and cultural notes consultation, and thus we claimed that name for those types of learners. Coincidently, we identified that the second approach accorded with the use of the rewind/pause controls and thus the *compulsive consultors* were also *compulsive rewinders*. Apart from these instances, this study can not claim any correlation of the use of help facilities and linguistic level and perceived language learning strategy use due to multiple factors: small sample, high variability in the sample, misinterpretation of some components of the SILL questionnaire, etc. Therefore, we can claim that, for instance, linguistic level is one of many factors influencing the frequency and the way students consult help resources but probably it is not the most influential in some cases. This, of course, is a matter for further investigation.

We can underline three aspects of this study which have contributed to the developing of CALL research and design. Firstly, the conceptualisation of the help facilities into the two broad areas (*Assistance* and *Guidance*) proved useful in the design phase, as I believe it will for future implementation and evaluation of any CALL software, i.e. in order to evaluate the degree of help provided by a CALL program in terms of *assistance* or *guidance*.

Secondly, the program itself which makes it a powerful tool for independent language learning in the areas of reading and listening. The combination of media facilitated in one environment, the computer, helps learners do activities on their own that are otherwise difficult to perform, especially in a foreign language learning situation where access to these media in combination is usually more restrictive. Furthermore, the fact that it is designed using web scripting languages adds an important feature for the future since the Internet and the Web especially are starting to be a common resource for CALL.

Finally, the use of Lotus Screencam software has proved ideal for the type of research intended. The recording of the computer screen movements together with the observation are two complementary methods which provide rich and valuable data. It allows the accurate description of how learners organise their learning and which favoured strategies they are deploying.

Our perspective has been global, trying to relate the use of the particular help facilities to the texts and tasks as a whole. We have applied descriptive analysis of students' use of these help facilities. This has allowed us to describe the learning strategies students were using in the process of completing their tasks and, at the same time, provide details of the different interactions between the students and the program. Describing and analysing these interactions have given us insights that have clear implications for future CALL design, especially those related to reading and listening comprehension, and for further research on aspects of CALL.

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