

A Tour Guide Course using Collaborative Virtual Environments

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Abstract. *In this work, it is described some of the results of an ongoing research focused on developing communicative practice in foreign languages, using networked virtual environments, which can be explored cooperatively over the Internet. A courseware, the Tour Guide Virtual Course, was specially designed to use virtual reality environments that represent the environments typically found in the daily life of an international tour guide. Preliminary tests of this courseware are also presented.*

Key words: Virtual Reality, Language Learning.

1. Introduction

Nowadays, tourism is one of the fastest growing industries worldwide, especially in developing countries, because most of them have all the makings of a tourism destination: natural beauty, historical cities, and culture. In order to attract international visitors, these countries demand more qualified tourism professionals, such as tour guides and hotel staff. The ability to communicate in foreign languages is an important aspect in the qualification of such people.

Learning and teaching foreign languages in a tourist guide training course aim to provide means for the learners to acquire the linguistic skills necessary for them to face the diverse situations imposed by this kind of job. Simulations of situations experienced in a tour guide's daily activities in classrooms seem to be too artificial and inhibiting, and consequently, do not contribute to the development of a fluent communicative practice.

All areas of education are experiencing changes in the way teaching and learning are perceived [Gonzales-Lloret 2003]. Teacher-centered, class-lecture based, and structural-syllabus instruction are giving way to a more student-centered, hands-on, practical, and flexible approach [Shank & Cleary 1994]. The field of second language teaching is not an exception in this paradigm shift. New theories and applications of language teaching are exploring the benefits of new methods and pedagogical approaches. Worthy of notice are task-based language teaching [Crookes & Gass 1993; Long, in press] and focus on form [Doughty & Williams 1998; Long 1998; Long & Robinson 1998].

Computer-Assisted Language Learning (CALL), one of the most significant areas of innovation in language education, has matured. The history of CALL suggests that the computer can serve a variety of uses for language teaching. It can be a tutor which offers language drills or skill practice; a stimulus for discussion and interaction; or a tool for writing and research. With the advent of the Internet, language learners can access foreign language documents on the World Wide Web, and communicate with their teachers, fellow classmates, and native speakers by electronic mail. If language teaching has become more exciting, it has also become considerably more complex [Warschauer 1996].

This work deals with one form of CALL, named *network-based language teaching* (NBLT). NBLT is language teaching that involves the use of computers connected to one another in either local or global networks. Whereas CALL has traditionally been associated with self-contained, programmed applications such as tutorials, drills, simulations, instructional games, tests, and so on, NBLT represents a new and different side of CALL, where human-to-human communication is the focus. Language learners with access to the Internet, for example, can now potentially communicate with native speakers (or other language learners) all over the world twenty-four hours a day, seven days a week, from school, home, or work. Those learners can communicate either on a one-to-one or a many-to-many basis in local-area network conferences. All this further multiplies their opportunities for communicative practice. Finally, the fact that computer-mediated communication occurs in a written, electronically-archived form gives students additional opportunities to plan their discourse and to notice and reflect on language use in the messages they compose and read [Kern & Warschauer 2000].

In the meantime, the low cost and ease of use of semi-immersive virtual reality environments have recently caused this technology to experience a very fast expansion all over the world. This technology has been used in networked computer environments and enables the integration of virtual worlds and the interaction among remote users in shared three-dimensional environments (Macedonia et al. 1995; Das et al. 1997; Funkhouser 1995). This kind of collaboration among users not only has a very important socialization aspect, but also increases the interest about a subject.

This work describes some of the results of an ongoing research focused on developing communicative practice in foreign languages, using networked virtual environments, which can be explored cooperatively over the Internet. For the development of communicative practices, virtual environments that simulate real world situations experienced by tourist guides have been created, and English was used as test language, although other languages could also be used. The research aims mainly at providing learners of tourist guide courses, as well as professional tourist guides, with:

- Immersion in communicative situations experienced by a tourist guide interacting with foreign tourists in a three-dimensional virtual environment;

- Opportunities of interaction which favor the development of the learner's linguistic abilities necessary for communication; and
- Opportunities of interaction between the user and the computer, in pre-planned situations, as well as among users linked through the Internet and intranets, in unexpected communicative situations.

The remainder of this work is divided in five sections. In Section 2, we discuss the use of virtual reality in education. Section 3 comprises a brief description of the task-based learning approach. In Section 4, it is described the implementation of networked virtual environments for language learning. In Section 5, it is presented the results of a preliminary test. Finally, in Section 6, we draw some conclusions.

2. Virtual Reality in Education

It is generally agreed upon that there are several characteristics or attributes that make Virtual Reality (VR) a unique and potentially very useful educational technology. According to [Crosier et al. 2002], VR attributes are a sub-set of the Virtual Environment (VE) attributes (Figure 1). This means that the VE attributes are those characteristics that can be influenced only by the VE itself. The VR attributes can be influenced not only by VR in general (e.g. the type of system used, input devices, etc.) but also by the VE (e.g. what is presented in the 3D environment).

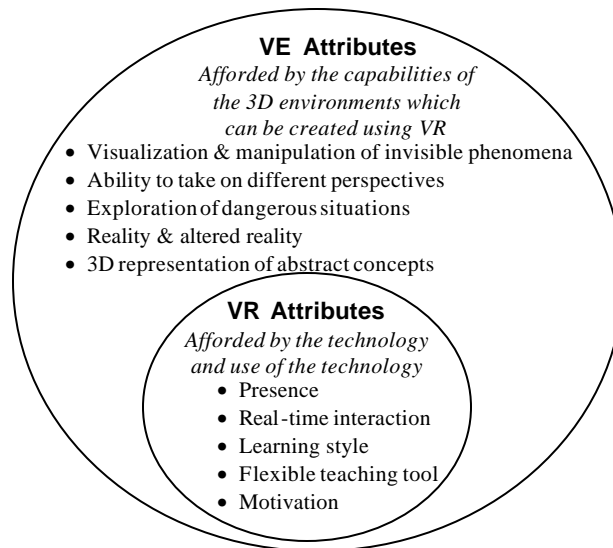


Figure 1. Virtual Reality and Virtual Environment attributes [Crosier et al. 2002].

VR applications developed for education have generally covered areas where the use of these attributes is suitable. In Cox (2000), for example, a single-user VE representing ancient Egypt has been developed in such a way that students could explore it while studying different subjects, such as biology (animal life), geography (landscape), mathematics (geometric shapes) and history. In [White et al. 1999], it is presented Vcell, a virtual, multi-user space where students "fly" around and play the role of cell biologists in a role-based, goal-oriented environment. Working individually, or with others, students learn fundamental concepts of cell biology and strategies for deductive problem solving through their experiences in the exploratory virtual space. This pedagogical approach provides students with authentic experiences that include elements of practical, experimental design and decision making, while introducing them to Biology content. In Wang and Chee (2001), it is presented a networked VE where users can collaboratively study physical phenomena, such as projectiles in motion, physics of falling objects and vacuum chamber.

VEs are safe environments for exploration and allow students to experiment with trial and error learning strategies without the negative implications of real world experiments. VR is a flexible educational medium since it can be used in a variety of different ways. From a hardware point of view, it can use different configurations, such as a common PC with simple I/O devices or even a sophisticated

setting of a CAVE system. From a workgroup perspective, it can be used individually or, perhaps, by a group of students engaged in a team demonstration or a collaborative exploration. Finally, from a pedagogical way of thinking the VE can be designed to provide different amounts of content, from a single concept to a whole topic; different levels of instruction, from a basic version for beginners adding layers of complexity as understanding develops; and different types of learning material, such as text, graphics and embedded videos [Crosier et al. 2002].

3. Task-based Language Learning

In a tourist guide training course, learning and teaching foreign languages aim to provide means for the learners to acquire the linguistic skills necessary for them to face the diverse situations imposed by the job of tourist guiding.

In order to produce pedagogical material using the socio-constructivist principles of learning [Brown 2000; Richard-Amato 1996] and the NBLT approaches to language teaching [Kern & Warschauer 2000], the Task-based Instruction model proposed by Willis (1999) is very suitable. The main idea of this model is the suggestion of activities in which the learner uses the target language to achieve a communicative result focusing on the conveyance of meaning and not on linguistic accuracy.

Although this model can be effective for learners with, at least, intermediate level skills, it could be very difficult and frustrating for beginning foreign language learners to carry out communicative activities because they lack both basic vocabulary and knowledge of linguistic forms. This feeling of frustration could even lead to the complete abandonment of the task.

In order to prevent learners from giving up performing a task because they consider themselves incapable of doing it, the two types of tasks proposed by Willis (1999) can be adopted: open tasks and closed tasks. Open tasks have broad and clear communicative objectives as well as general and undefined instructional purposes for the acquisition of some linguistic forms. Closed tasks, on the other hand, have specific and definite instructional purposes and lead to the controlled use of the linguistic forms.

4. Virtual Environments for task-based language learning

In this section, it is described the complete set of software tools that comprise the Tour Guide Virtual Course. The course's pedagogical material is distributed in five lessons, which model five different communicative situations frequently experienced by tour guides in their daily activities. Each lesson was designed according to the Task-based instructional model discussed in Section 3, and basically, consists of one open task, named "Task", and a set of closed tasks, the so-called "Mini-tasks".

The Task, which is always the first proposed activity, represents the core of the lesson and is performed in a virtual environment associated to the modeled situation. If learners feel they have enough linguistic ability to accomplish the proposed activity, they can proceed to the virtual world and perform the Task interacting with the other students. However, if they do not feel confident enough and think they might need preparation to accomplish it, they should, first, carry out the activities in the Mini-tasks. After finishing the Mini-tasks, the learner will then be able to proceed to the virtual environment to perform the Task with the other students.

It should be emphasized that, from a pedagogical point of view, the efficiency of using the Task-based instructional model in learning and teaching a foreign language can be hindered by the learner's lack of competence in semantic and grammatical aspects to perform successfully even the Mini-tasks [Borges 2001]. To solve, or, at least, to minimize this problem, the following auxiliary tools, which can be accessed by the students at any time, were developed to offer them specific information:

- **Search on the web** – provides additional information about places or about the situation that the learner is focusing in the lesson;
- **Glossary** – provides the English pronunciation and the translation of words or idiomatic expressions from English to Portuguese or from Portuguese to English, with sentences exemplifying their use in the context of the lesson, since the glossary's content was exclusively designed based on the communicative situations of interest;

- **Function boxes** – provide the grammatical structures and the vocabulary necessary to perform the communicative functions required in the Mini-tasks.

In preliminary tests, it was concluded that learners, depending on their level of linguistic proficiency, might need additional pedagogical material to carry out the activities proposed in the Task and Mini-tasks. Thus two other tools were designed to help them:

- **Focus on Grammar** – grammatical aspects of the English language, considered to be of paramount relevance for the carrying out of the communicative functions;
- **Focus on Pronunciation** – phonological aspects of the English language also considered as being of importance for the oral interaction between a tourist guide and the foreign tourists.

For the purpose of developing a prototype, it was decided to implement only the set of tools and the virtual environment related to Lesson 3 – Shopping for handicrafts. All the lessons, including Lesson 3, the description of their corresponding tasks and the virtual world, are listed in Table 1. The students can use a multimedia system to do the Mini-tasks and a networked virtual environment to perform the Task.

Table1. Lessons of the Tour Guide Virtual Course

Lesson	Description of the Task	Virtual world
1. Welcome to Fortaleza	The guide is at the airport lounge waiting for a group of tourists she has to take to the hotel. She is supposed to welcome the tourists, check their names in her list, group them and take them to the bus.	Airport
2. Transfer In	After welcoming the tourists at the airport the guide should take them to the hotel. On the way to the hotel, she should greet the tourists, introduce himself and give some information about the city. Also she should tell the tourists about some of the beaches in Ceará and offer them package tours to those beaches.	Bus
3. Shopping for Handicrafts	The guide has just arrived at the Tourism Center with a group of tourists who want to shop for handicrafts. The guide should help them with their shopping.	Tourism Center
4. Having Fun at Cumbuco Beach	The guide is taking a group of tourists on a tour to Cumbuco beach. On arrival, she should give them some information about what they can do there. During their stay, she should help the tourists order their meals at the beach hut and answer their questions about the activities they may want to take part in.	Beach Hut
5. City Tour	The guide is a freelancer tour guide. She is informed that Virtual-Tour Travel Agency has an open position for tour guide. She goes there to find out how to apply for the job. She is informed that she has to take a selection test.	City

The prototype is divided into four main modules: the Student Module, the Teacher Module, the VR Module and the Spy Module. This prototype was built based in the “ÁRVORE” architecture, which is a generic model developed so that multi-user virtual reality environments and multimedia resources can be made available even over low bandwidth computer networks [Vidal et al., 2001]. There are servers and auxiliary tools connecting these modules through a TCP/IP platform.

4.1 The Student Module

The Student Module is essentially a multimedia system used during the individual training phase, the Mini-tasks preparation phase. It enables the students not only to access the lesson’s contents, but also to interact with other students and teachers. By using this application, students produce texts and record their own speech, which then may be sent to a teacher for correction. During this phase the communication can be synchronous (chatting among online users) or asynchronous (sending texts and recorded speech to a teacher). The pedagogical tools, previously described, can also be accessed through the Student Module (Figure 3). So, students can, for example, consult a bilingual glossary specially developed for the course;

listen to the correct pronunciation of a word or expression; and, in case a word or an expression cannot be found in this glossary, the student has the opportunity to launch a search on a web dictionary.

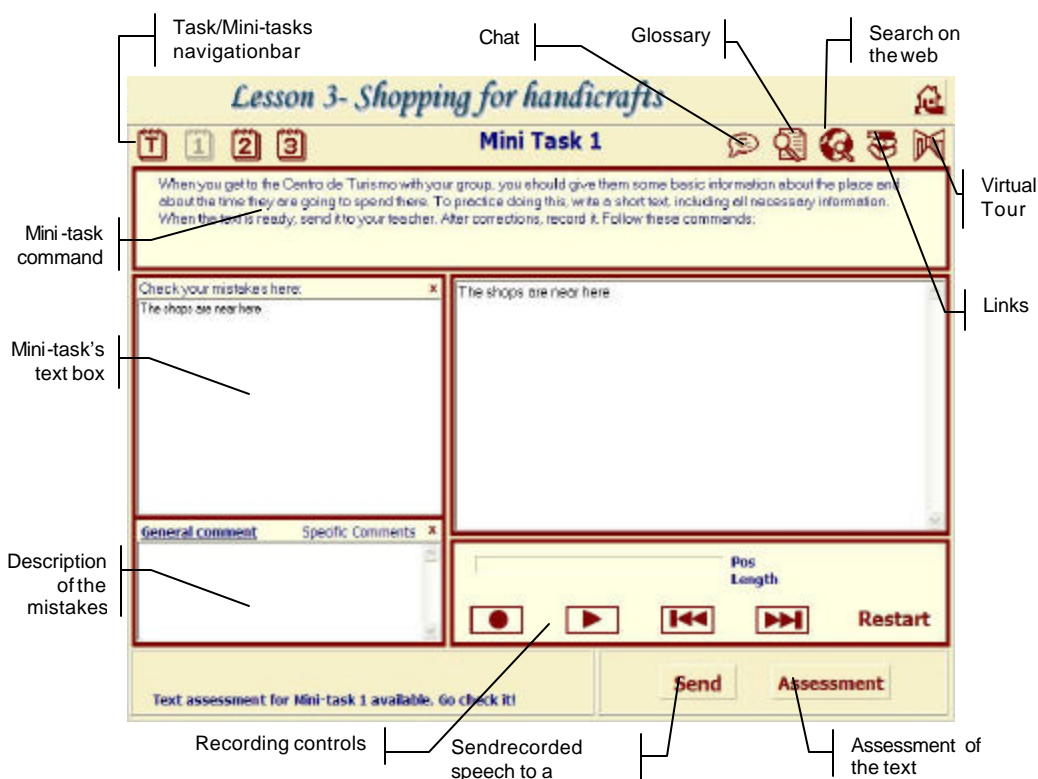


Figure 3. Mini-task 1 recording speech form.

4.2 The Teacher Module

The Teacher Module is the application used by teachers in order to keep track of the students carrying out the tasks and to help them whenever necessary. By using this application, teachers can chat with the students, access the glossary and assess the students' progress by examining the texts and recorded speech they produce (Figure 4). When a number of students are ready to do the Task, the teacher, through this module, can divide the students into groups in order for them to enter the virtual world.

4.3 The VR Module

The VR Module enables teachers and students to interact inside a shared virtual world and to experience the communicative situations proposed in the course. The virtual world modeled for Lesson 3 is the "Centro de Turismo", a tourism center in the city of Fortaleza (Figure 5).

Inside the virtual world, students can play two kinds of roles: guide and tourist. When forming a group, the teacher defines which role each student will play, one will play the guide and the others will play the role of tourists. The teacher will give all the students a chance to take turns as a tourist guide.

After finishing the Mini-tasks in Lesson 3, every student is supposed to have recorded a short speech with some basic information about the tourism center and about the time the group will spend there. When a student is playing the role of guide inside the virtual world, she is instructed to play the sound of her speech so that the others, playing the role of tourists, can listen to it. Furthermore, the guide should answer the tourists' questions and invite the tourists to go back to the bus when the time for visiting is over. On the other hand, as a tourist, the student receives from the teacher instructions about what she should do in the virtual world. For example, she can ask the guide for directions, or explanations

about how a handicraft is made. There are several tasks of this kind, and the teacher can add more tasks according to the number of tourists.

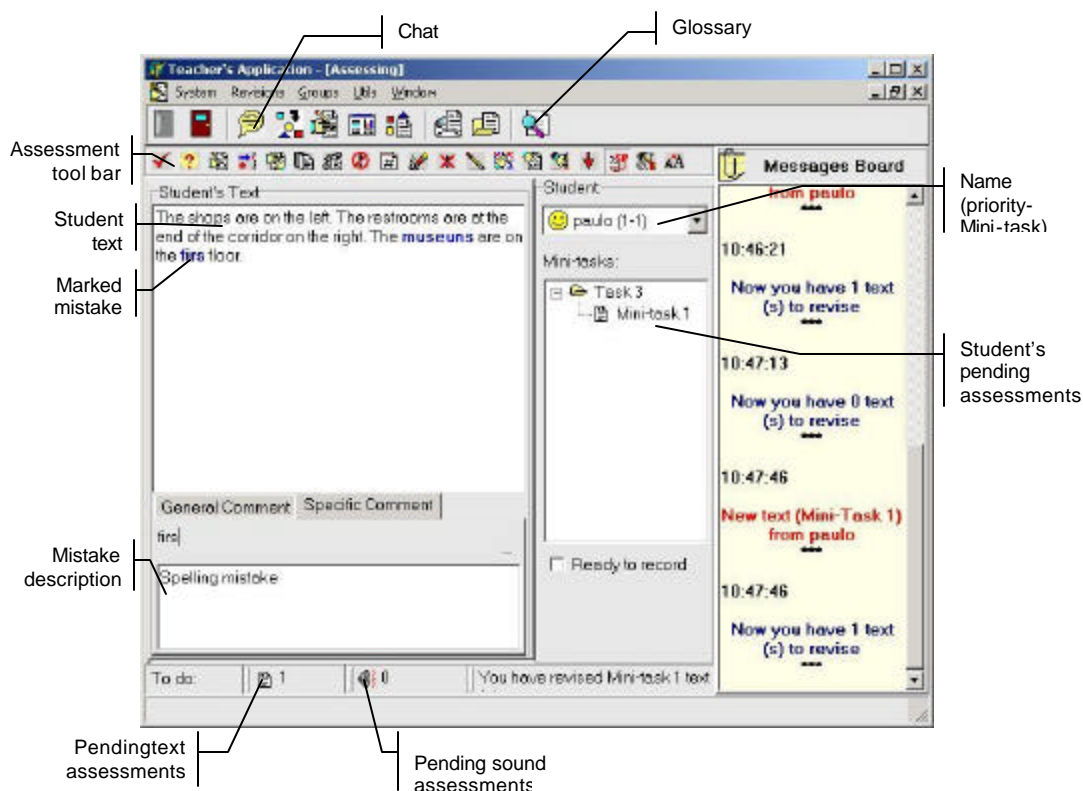


Figure 4. Text assessment.

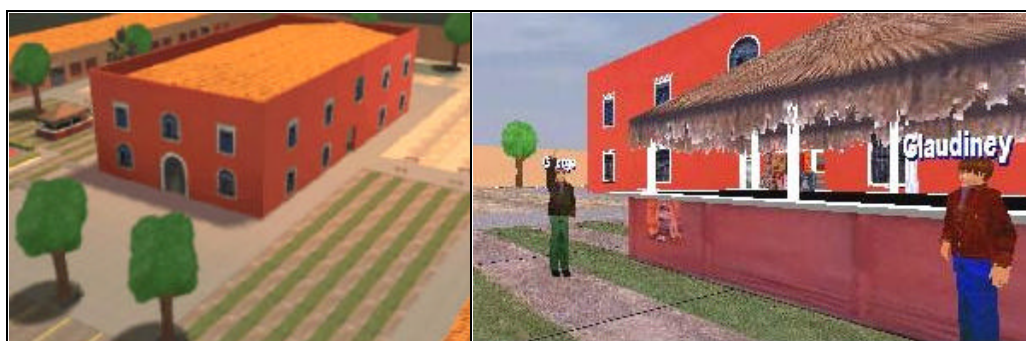


Figure 5. Virtual world modeled.

In the virtual world, there are important resources available for students and teachers to interact with each other and perform the task.

4.3.1. Exploration resources

Students and teachers represented by their avatars can navigate through the three-dimensional elements of the virtual world. Students can also visit the virtual world before performing the task in order to familiarize themselves with the virtual environment. They can also manipulate interactive objects, such as

bottles and pieces of clothing. There are more specialized interactive objects, which can behave in complex ways, such as detecting collision and reacting to touch.

4.3.2. Communication resources

The basic communication resource available in the virtual world is text-based chatting. However, other communication resources are used to enhance or to complement the text communication. Thus, for example, body language – naturally used in human interactions – can be simulated by means of animated virtual bodies. That is, the guide can also point while indicating directions to the tourists (Figure 6).



Figure 6. Guide giving information about how a product is made.

As mentioned before, students can play sounds previously recorded during the preparation phase. This enriches the activities carried out in the virtual world. When the teacher chooses who will be the guide, her Teacher Module automatically sends a download signal to the Student Modules of all the students participating in the Task. Upon receiving the signal, the Student Modules automatically download the sound file of the guide from an FTP server and play it whenever the guide decides.

4.3.3. Translator Agents

The translator agents are autonomous virtual humans inside the virtual world that incorporate the glossary tool described before. Since they act just like regular users, students can send them messages, through chat, to get words translated.

4.4. The Spy Module

When the students are performing the task, the teacher can participate in two ways. The first way is playing the role of a tourist. The other way is using the Spy Module. The Spy Module is a tool that allows teachers to enter the virtual world without being noticed by the other participants. The teacher is able to see all the text messages sent and received by students. No matter what way the teacher chooses to participate, the system logs every message sent. These logs were used for evaluation in a preliminary test of the course.

5. Evaluation of a preliminary test

As a preliminary test, a group of five student volunteers preparing to be tourist guides was invited to use the prototype. The test has been carried out by two graduate students in Foreign Languages for five days: 4 days in the Mini-tasks phase and the last day in the Task phase. The great difficulty of the test was that students were in different levels: beginner, intermediate and advanced. So, some of them finished the preparation phase sooner than the others. After finishing the test, the students and teachers were asked to fill out a questionnaire in order to evaluate the Tour Guide Virtual Course. The items in the questionnaire can be grouped in two categories:

- technical resources related to multimedia and virtual reality (evaluated by teachers and students), such as interface of the modules and navigation inside the virtual world;

- pedagogical material (evaluated only by students), such as the relevance of the requested Task and Mini-tasks and the pedagogical tools, such as the glossary and the functions.

All of the students agreed that the software would help them to develop the linguistic competence in English language and, consequently, contribute to their professional improvement. In their own words, “this method motivates us to perform the requested functions mainly because there is a glossary, and links to websites with significant information. Other positive point is that we can use the software at home or at work, during our spare time”. Referring to the virtual world, one of the volunteers found it very interesting: “You really experience the situation of a tourist guide”.

All of the items in the questionnaire were evaluated as Good or Satisfactory. Only one of the volunteers assigned Unsatisfactory to items related to *Level of linguistic difficulty to perform what is requested (Task, Mini-task)* and *clarity in definitions and or translations (Glossary)*. However, it was easy to conclude that this volunteer was at the beginner level, which justifies his opinion.

6. Conclusions

This work described some of the results of an ongoing research focused on developing communicative practice in foreign languages, using networked virtual environments, which can be explored cooperatively over the Internet. The result is the Tour Guide Virtual Course specially designed to use virtual reality environments that represent the environments typically found in the daily life of an international tour guide. The final system provides:

- immersion in communicative situations experienced by a tour guide interacting with foreign tourists in a three-dimensional virtual environment;
- opportunities of interaction which favor the development of the learner's linguistic abilities necessary for communication; and
- opportunities of interaction between the user and the computer, in pre-planned situations, as well as among users linked through the Internet and intranets, in unexpected communicative situations.

The designed material, which, at first, will be used in the development and training of communicative abilities in English by a tourist guide, can be adapted to the teaching and learning of other foreign languages. Moreover, the didactic pedagogical material can be adapted to other types of distance education projects.

The Task-Based Instruction proposed by Willis (1996) proved to be effective in the language teaching and learning process mediated by computer. The volitional control of learning by users also benefits from the dual model: open tasks and closed tasks. However, the model is not sufficient in itself, especially if it takes into consideration the learners' different levels of English proficiency and styles. In this case, additional help is required to provide specific information. Being so, Search on the Web, Glossary, Function boxes, Focus on (Grammar and Pronunciation) are of great help so that the users can perform the tasks successfully.

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