

Integration of computers in the classroom: the use of the UNIX operating system as a tool

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Abstract

In this paper we present our ESP teaching experience to computer science students at the Escuela Universitaria de Informática at the UAB using the UNIX operating system as a learning tool. Concretely we detail the new approach adopted for our practice classes.

1. Teaching enviroment

To obtain the degree taught at this school (Ingeniería Técnica en Informática) students have to take two English subjects: Inglés Técnico I and Inglés Técnico II. These courses consist of both theoretical and practice classes. Although this may seem a little bit odd at the beginning, this organisation was adopted in order to fit in with the other subjects of this degree. Both subjects focus mainly on reading scientific and technical English texts since being able to read and understand computer manuals and articles from scientific magazines is one of the students' more important needs. Some emphasis is also given to written English, especially technical reports. The syllabi of these subjects were designed taking into consideration the rhetorical functions typically found in technical English as well as vocabulary and expressions related to computer science.

Our teaching activity is also determined by the number of students per class and their English proficiency. Unfortunately, classes are far too crowded -about 120 students are enrolled in each one. Students come from different academic backgrounds: some have studied BUP and COU, whereas others come from FP2. Some come directly from their secondary studies while some have spent several years working before

reassuming their university studies. Thus, as can be supposed, students' English proficiency is not at all homogeneous, nor are their study habits. The English level may range from absolute beginner to intermediate or even advanced.

We should also mention the fact that English as a subject is considered to be less important than other subjects students have to take (e.g. Operating Systems, Digital Systems, Calculus, Algebra, Computer Networks...) As a result English classes are usually the first ones to be skipped when exam periods or other critical times come around.

2. Task based framework in practice classes

Taking all these factors into consideration (high number of students per class, heterogeneous English proficiency, irregular and low attendance to classes) we decided to re-design our practice classes. We adopted a task-based framework, following Jane Willis (1996; see diagram next page). We tried to create a good learning environment for language learning. According to this author, successful language learning takes place under four conditions (see Graphic 1):

Exposure. This involves listening or reading, or both, in the target language.

Use. The learner has to have the opportunity to express himself/herself in the target language, i.e., to use it to communicate.

Motivation. Learners have to be motivated in two senses: to decipher the language and to cipher it.

Instruction. Willis does not consider instruction to be an essential factor for successful learning. In fact, we can learn a foreign language without being formally instructed. And the opposite also holds: to follow, for example an English course or even several courses, does not necessarily entail that, afterwards, we will be able to understand English, to read and write in English and to talk in English.

Our classes are thus designed to increase the amount of exposure to English scientific texts, to give our students more opportunities of using the English language to communicate, and also to enhance their motivation. The course consists of 4 practice exercises. We devote 3 or 4 sessions to each one, which is to say 3 or 4 weeks. The exercise design follows the three phases that constitute the components of the task-based framework: Pre-task, Task cycle and Language focus, proposed by Jane Willis 1996, *A Framework for Task-Based Learning*, p. 38, adapting them, of course, to our own style of teaching (see Graphic 2).

We are going to proceed by describing in detail one of the exercises practice, the one devoted to modal verbs.

3. Description of the activity

In this practice exercise the aim was to study the modal verb uses which are relevant for learners of English in the field of computer science. To do so, we decided to program a practice exercise that was task-based instead of the ordinary type of grammar exercises for the reasons stated above.

The task proposed to the students was that of finding occurrences of certain uses of modal verbs in a corpus of technical English, more specifically in a text related to the field of artificial intelligence. To carry out this practice exercise two tools were indispensable: a corpus and the UNIX operating system. In this section we are going to briefly describe the main characteristics of both.

3.1 Necessary Tools

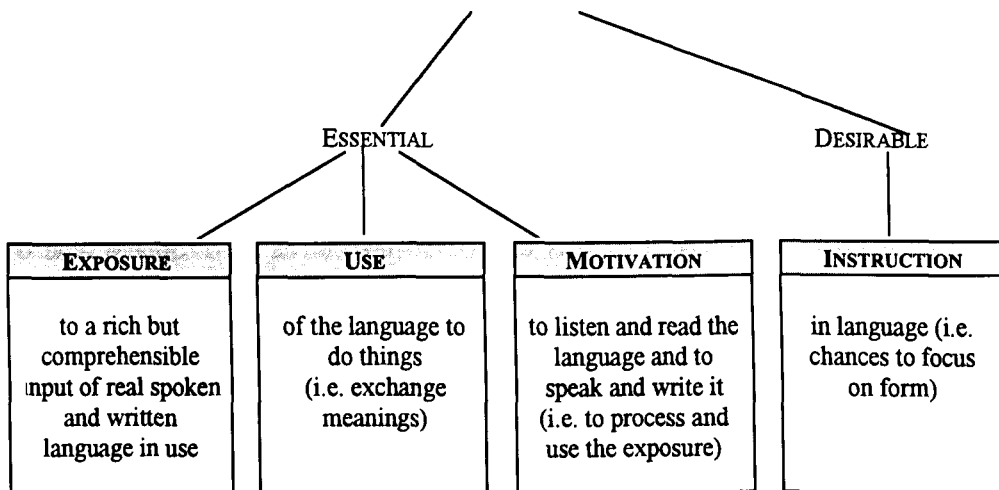
3.1.1 Corpus.

Even though we are conscious that currently there is a significant number of corpora available for the study of the English language both in the market and on the Internet, we decided to build our own for several reasons.

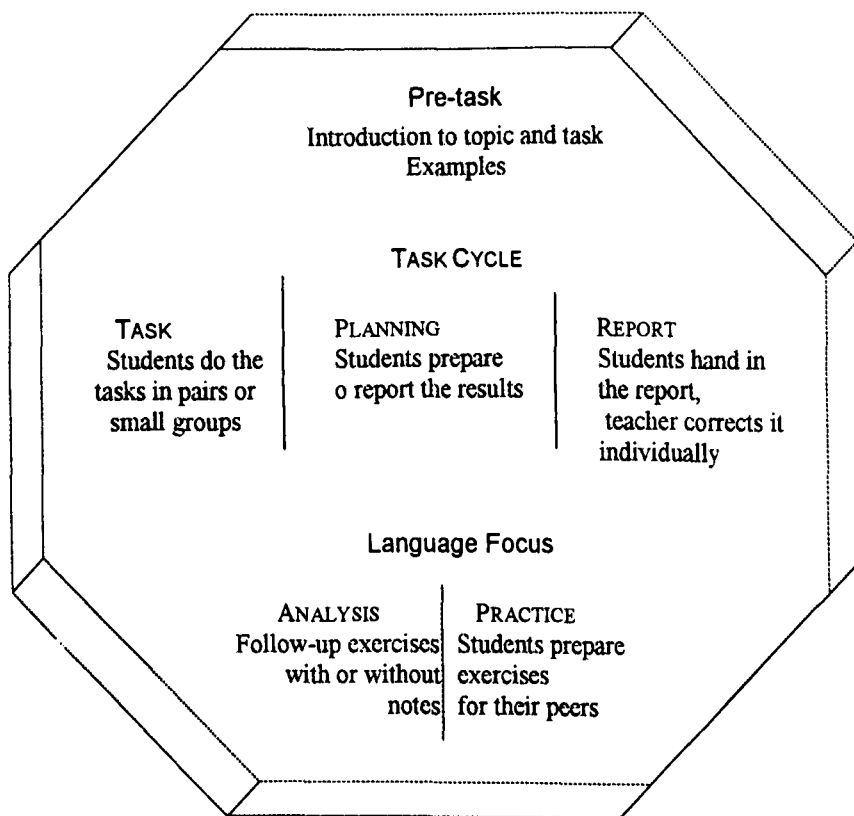
First and foremost, we are teaching ESP and therefore we are interested in the teaching of those grammatical and discourse points which are relevant for our students. This is the reason why a text in general English does not meet our needs. Secondly, the size of the corpus was also important. For the practice exercise we had in mind, it was sufficient with a certain number of occurrences. The corpus to be built should make it feasible to study most instances and at the same time it should allow the activity to be guided.

Thus, we decided to build our own corpus. We downloaded from the Internet some magazines on Artificial Intelligence. The final corpus was a text file of about 100.000 words in which each sentence was treated individually so as to facilitate the ulterior search. We did not consider it necessary either to tag the corpus or to syntactically parse it since we only needed the occurrences of certain words and their context of appearance.

CONDITIONS FOR LANGUAGE LEARNING



From J. Willis (1996) *A Framework for Task-Based Learning*, p. 11, Longman



3.1.2 Unix

As far as Unix is concerned we should first mention that this operating system allows the user to deal with huge text files. We decided to use the UNIX system, instead of other available software that also serve the same purpose, for a couple of reasons.

In the first place, in spite of the fact that we had the 'TACT' program, it was not possible to use it: it requires extended memory and since we are working on an intranet, this type of memory is not available. This is why we decided to favor the use of the UNIX OS. It also serves another purpose which is that of integrating the English subject with other subjects -such as Operating Systems- which are central for computer-science students. Mention should be made that the students did really enjoy using the UNIX OS as well as writing their own searching programs. Some of them even admitted to having learnt more UNIX in this practice exercise than in the theory classes of the subject matter.

3.1.2 The Activity

This practice exercise was divided into three parts. The first one involved looking for examples and uses of some modal verbs, the second one involved a reflection on linguistic considerations, and finally the third part consisted in reflecting upon a particular modal verb. To carry out the first part of the practice exercise students were provided with a list of the modal verbs and their uses in general English. We presented this list and studied it in the classroom. From that list a shorter one was elaborated. Next, they had to find examples of these uses in the corpus and then provide a sentence that exemplified the use for each modal verb that allowed it and that could be found in the corpus.

To do so, first they had to download the file called 'corpus.txt' to their own accounts in UNIX using *ftp* facilities. Once they had done so, they had to relate the uses described in the handout to the modal verbs that could instantiate that use. For instance, it is possible to express *certainty* by using the modal verbs *will*, *must* and *can't*. Once they had decided which modal verbs could express each one of the different uses, they had to find instances of the verb and decide which of the sentences returned in the search were really used in that sense.

To carry out the search the basic UNIX command to use was 'grep'. The simple instruction line was something of the kind:

```
$ grep ' can ' <corpus.txt >can.txt
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Examples of search results

1. Eager case adaptation CAN also be described as extension-first.

1. There is a plane located at Ip which **CAN** be used to transport the package.
2. A ground operator sequence is said to be a solution for a planning problem if it **CAN** be executed from the initial state, and the resulting state of the world satisfies the goal.
3. Syntactically, a plan in this space **CAN** be seen as a set of constraints (see below).
4. This replay strategy **CAN** be contrasted with that of PRODIGY/ANALOGY [40] where replay is alternated with from-scratch planning for extra goals not covered by a case.
5. Goals that are laboriously serializable for a state-space planner (in that there exist few goal orderings for which the goals may be solved in sequence) may be trivially serializable for a plan-space planner (meaning that the goals **CAN** be solved in any order).

With this instruction we are only saying that each instance of "can", with a blank before and after, found in the input file called 'corpus.txt' should be saved in another text file called 'can.txt'. This is the simplest form of the command and from it they can elaborate more sophisticated forms in which the searches are concatenated or in which, once the word is found, it is to be replaced by bolds and upper case, etc. In the former command we would save time in the searches and in the latter we would facilitate the reading of the sentences.

Complicating the search commands is not really necessary since we could also edit the outcome files with an ordinary word processor such as Word. But since our students are students of computer science they really enjoy this kind of activity. Once they have all the files with all the examples of the modal verbs they have searched for, they have to read some of them and look for the examples of the different uses they have been provided with. It is not necessary to read all the examples and that has to be made clear. Otherwise, due to the size of some of the files the practice exercise would become too boring and tiresome. Once an instance of a use has been found, they should go on looking for different uses.

When they have found everything they had to, they have to decide on the reason why some of the uses were not in the corpus file. The first time you ask for this type of linguistic reflection is really hard on them since they do not really know what they are expected to do. Some explanations are required and if you repeat this type of task again during the course there will not be so much trouble after the first time. Of course the answer to this second part – *Why are some uses not found in the corpus?* – reflects

the nature of scientific discourse itself and the unlikelyhood of anyone expressing certain functions such as promising, offering, etc. in a text of these characteristics.

In the third, and final part of the practice exercise, students were asked to study in detail one of the modal verbs. In this case they were to study the modal verb *can* and its uses in general and technical English. Then they had to compare some passive structures with some attributive ones in which this modal verb was found. In this last section they had to make remarks about the type of syntactic subject selected in these two structures and also decide on the reasons why one of them was more usual in technical English than the other one.

After the practice exercise was turned in and corrected by the teacher, a follow-up was conducted. For that two strategies were used. First the exercises were given back to the students and examined in class. We commented on the more frequently used examples and we explained why some modal verbs are used in one sense and not in another. The more frequent mistakes were also considered.

After this session another was devoted to a typical grammar exercise in which some of the students were allowed to use their notes and even to comment on the answers. The main aim of this session was, in the first place, to check how the topic had been learnt, but while doing so we also realized that giving them the possibility of going through the notes was positive as well. In one of the groups the students were not permitted to check their notes whereas another group of students was allowed to do so. The level of motivation and discussion was certainly higher in this second group as was the time of exposure to and reflection upon the language. As a result, the level of learning achieved also appeared to be higher in the second group.

4. Conclusions

During the present course we have implemented a series of practice exercises of the type just described above. On the whole, we have carried out four of them with their respective follow-up sessions. Besides the one described in the present paper, we have performed a practice exercise on error correction, using the computer tools provided on the school net; another which consisted in the translation of the UNIX help manual found online on the Web page of the school; and finally, another exercise using the corpus file we have already described but this time to work on relative clauses.

One of the reasons for proposing this type of practice class was the aim of integrating the English classes with those taught at the EUIS that are more subject specific. The reason for wanting to integrate English with the other subjects in the

school is that of making them feel that English is not a completely unrelated subject. We can say that we are pretty enthusiastic about how things have gone since we think that this goal has been fully achieved. Another problem at the school, class attendance, has also been sorted out. The number of students regularly attending practice classes has tripled and we have far more people in the practice classes than in the theory ones.

As a result of this the amount of work performed by the students in the practice classes and outside them has increased amazingly. This is the reason why we have decided to give a higher percentage of the final grade to the scores gotten in the practice exercises, in this way moving the focus of evaluation from just testing the proficiency to rewarding effort put into the learning process. Students think this quite a good idea and it particularly will help those students that arrive at the school with a lower level of English.

So, the idea is to have two possible paths for evaluating and each student should be able to choose the one he or she prefers in accordance to their needs and knowledge of English. Those students who want to sit the final exam and do not want to attend classes regularly will be able to do so and they will get their final score out of the final exam. Those students who are willing to come to class and work on the exercises designed for that course will get a 40% of their final grade from the average of the scores they get on each one of them. This type of evaluation is also being done in other subjects at the school such as Digital Systems and so we are also integrating English from this point of view, which really fits our idea of how English should be compatible with the rest of the subjects taught at the EUIS.

As the final remarks on this exercise, we would like to comment upon a beneficial side effect of the change in approach. The atmosphere generated in the classroom has been much more positive, probably due to that fact that we have shifted the focus of the learning process to adopt a learner-centered approach and abandoned the typical teacher-centered approach. Students have willingly taken the role of protagonist and share their knowledge about English or computer science with their fellow students. So, any time a question arises, especially a technical one, we always try to let one of them answer it so it becomes the rule to ask and help each other instead of always asking the teacher for help.

After each practice exercise students always filled out an anonymous evaluation sheet with any remarks, comments, improvements or ideas they had about that practice class. As a whole, the remarks have been especially positive although a few students

did not completely understand the new dynamics of the class and therefore thought they were not learning as much as they would in a traditional class.

As far as motivation is concerned, we can assert that they seem much more motivated about English than in previous years. This has been seen in not only their higher attendance but also in the student's serious dedication to the subject: when the teacher entered the classroom the students were already working on their computers writing or searching or doing something related to the classroom task. Also, when the teacher left the classroom because class had finished most of the students went on working on the exercise instead of dashing out as usual in an ordinary class. We could say that they were really the ones who marked their own working pace and for this reason we considered that the classes had become genuinely learner-centered.

To conclude we remark that this has been a first experience in the implementation of this type of practice exercise using computers in the classroom for the teaching of English. Since it is a first approach it can obviously be improved. On the other hand, what we propose is not just a different format for the run-of-the-mill, filling-in the blanks or rewriting sentences exercises. We hope to move a step forward and our aim is to use the students' knowledge of computer science by designing exercises in which that knowledge can be used to work with English and thus, through exposure and reflection, to learn the language.

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