

EFL UNIVERSITY STUDENTS' COGNITIVE PROCESSING OF SPOKEN ACADEMIC DISCOURSE AS EVIDENCED BY LECTURE NOTES

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This paper presents an empirical investigation of the role of EFL university students' bottom-up and top-down processing in academic listening. EFL student notes from a Tourism lecture were analysed according to their test answerability, that is the test questions they helped answer. The true-false questions administered to check comprehension were classed as a) "supporting" or b) "main" according to whether a) they asked for specific facts, examples or ideas supporting the main concepts in the lecture and therefore required accurate bottom-up processing or whether b) they referred to more general, essential and recurrent concepts in the lectures, which the students could mainly try to answer by resorting to top-down processing. The student notes were also classed as "main" or "supporting", depending on the type of question they helped answer. Two paired t-tests conducted on the T/F scores and the answerability scores, respectively, revealed that both high-proficiency and low-proficiency students were weaker in bottom-up than in top-down processing. This paper also provides evidence of some common EFL auditory processing difficulties: word beginnings, endings, number of syllables and function words.

Introduction

As Faber et al. state, students "believe that taking notes is a necessity that will provide them with a source from which to study at a later time" (2000, 257) and, in fact, different studies seem to confirm their belief. Note-taking has been frequently found to increase recall, comprehension and retention of subject matter (Kiewra 1985, 1989; Spires & Stone 1989; Czarnecki et al. 1998; Kneale 1998, Faber et al. 2000; Trafton & Trickett 2001). Other studies, however, have not found a significant effect for note-taking on performance (see Kiewra 1985, for a review). According to Kiewra, the success of note-taking depends on the students' level of engagement: whereas verbatim notes involve very little engagement, notes which employ summarisation, self-questioning and problem solving, for example, involve significant levels of engagement and therefore lead to better performance.

In other words, notes can be used merely for external storage, that is to record and store the lecture material verbatim for the purpose of later reference. However, it is really when note-takers relate what they are hearing to their prior knowledge and therefore synthesise and transform the aurally received input into personally meaningful form (the encoding function of note-taking), that comprehension of the material can be increased and internalisation is more likely to take place (Dunkel 1988; Faber et al. 2000; Trafton & Trickett 2001). It is precisely because of this supposedly facilitative effect of note-taking on both student attention and retention of academic discourse, that educators and scholars hold that note-taking instruction should be in the curriculum (Dunkel 1988; Faber et al. 2000).

Over the last few decades, studies into tertiary education have revealed that students from non-English speaking backgrounds have particular problems in comprehending lectures in English-medium universities (Bilbow 1989; Flowerdew & Miller 1992; Flowerdew 1994; Reid et al. 1998; Mulligan et al. 2000). It is noteworthy here that this situation seems only natural considering "the heavy emphasis (normally placed) on reading and writing skills, rather than listening skills, in poorly resourced English language teaching programmes" (Mulligan et al. 2000, 313).

Despite all the debate as to the appropriateness of lecturing as a teaching method, it is clear that the lecture is, for most courses, the principal mode of teaching (Clerehan 1995) and it will continue as a teaching method in universities for the foreseeable future, as Mulligan et al. state (2000). Besides, the enhancement of academic listening skills is crucial for the professional development of those students who will eventually need to function effectively in professional situations where English is the medium of communication. Thus, given the noticeably sparse L2 research in this field (Dunkel 1988; Clerehan 1995), we firmly believe there is clearly a need for further experimentation which throws light on the characteristics of EFL lecture information processing.

In this paper we report the findings of a preliminary study conducted to determine the nature of EFL Spanish university students' comprehension difficulties by analysing the features of their notes since they provide a unique window into the cognitive processing of academic speech.

1. Bottom-up & top-down processing

Comprehension is viewed as a combination of both bottom-up and top-down processing. Bottom-up processing involves the rapid decoding of lexical and grammatical forms. In other words, it refers to the analysis, categorisation and interpretation of incoming data on the basis of the information in the data. For example, bottom-up processes are those that assign grammatical status to words on the basis of syntactic and morphological cues and those which assign meanings drawing upon syntax, word order and the meaning of lexical items present in the given piece of discourse. Top-down processing, on the other hand, refers to the use of background knowledge or schemata to facilitate the comprehension process. This type of knowledge, which the listener makes use of in order to make inferences about the topic and structure of a piece of discourse, is based on real knowledge of the world and different types of frames, schemata and macrostructures (Rumelhart 1977; van Dijk 1977; Carrell and Eisterhold 1983; Carrell 1984; Chaudron 1986). Although for a considerable time comprehension theorists tended to view bottom-up and top-down processing as in a hierarchical relationship, nowadays most scholars advocate the interactive approach and argue that comprehension involves a number of processes which interact and are therefore complementary, though it is not possible to determine how they do so (Clark and Clark 1977; Anderson, 1983, 1985; Sternberg & Powell 1983; Carrell, Devine and Eskey 1988).

A first approach to the notes collected in this study seemed to reveal recurrent processing difficulties which were apparently confirmed by the rather low TOEFL and comprehension scores some of these students obtained (see Table 1 &

Table 2). In order to find the source and nature of these students' comprehension problems, we decided to start by analysing their top-down and bottom-up processing of the lecture material as evidenced by their notes and relate it to their test performance. This analysis was exploratory in nature, therefore no hypotheses were made prior to the study.

1.1 Method

1.1.1 Subjects

The participants were 47 first-year university tourism students who were studying listening comprehension, as well as the other skills, at the Universidad Autónoma de Madrid (U.A.M), as part of their compulsory eight-month ESP programme.

The objective of this ESP course, leading to an upper intermediate level of English proficiency, is to train students to interact and work effectively in the tourism industry. It is also the aim of this course to provide academic listening training in preparation for an optional content-based subject in the curriculum as well as for the exchange programmes students can opt for in third year.

Five students who chose not to take notes had to be excluded from the study.

Thus, the analyses were finally performed on a sample of 42 students.

Table 1 displays the TOEFL total scores. Their average score was 517 and these scores ranged from 420 to 648.

The students' TOEFL scores were then classed into 4 levels: *level 1* comprised scores below 500; *level 2* scores ranged from 500 to 550; *level 3* included scores between 551 and 600; and *level 4* scores ranged from 601 to 648. In the first level there were 16 students, in the second 14, and in the third and fourth level there were 7 and 5 students, respectively.

Table 1 Descriptives for TOEFL

| | n | Minimum | Maximum | Mean | s.d. |
|-------------|----|---------|---------|------|------|
| TOEFL Total | 42 | 420 | 648 | 517 | 54 |

1.1.2 Materials

1.1.2.1 Lecture

A lecture on the socio-cultural impacts of tourism was developed from authentic sources for use in this study. This fifteen-minute lecture of the reading style (see Dudley-Evans 1994) was recorded by a native speaker working at the U.A.M.

1.1.2.2 Comprehension measures

Two measures of the students' comprehension of the lecture were employed in this study: a twenty-item listening cloze and a ten-item true-false exercise. These two measures covered the most important aspects of the lecture and they were pilot-tested and revised before inclusion in the study.

The scoring method chosen for the cloze test was the exact word method: each correct item was awarded 1 point. The true-false questions administered in this study were scored as right (1 point), partially right, i.e. incomplete (.5 points) and wrong (0 points). A maximum score of 10 could be achieved on the T/F test and 20 on the listening cloze.

Since both comprehension measures were found to have a high intercorrelation (Pearson correlation = .859), the analysis reported in this study was finally based only on the true-false questions. This decision was taken because the true-false test, which required the students to justify their answers, provided more insights into their cognitive processing of the lecture material.

The ten true-false questions were classified into two groups according to whether a) they asked for specific facts, examples or ideas supporting the main concepts in the lecture and therefore required accurate bottom-up processing or whether b) they referred to main and recurrent concepts in the lectures, which the students could try to answer by resorting to top-down processing (that is, by resorting to the schema activated by recurrent incoming linguistic input and their background knowledge). Each group—the "supporting" and the "main" group, respectively—contained 5 questions.

1.1.2.3 Student notes: test answerability

Since "test answerability", that is the number of test questions answerable from the students' notes, has proved to be a predictor of postlecture test achievement (Hartly and Marshal 1974; Palkovitz and Lore 1980; Dunkel 1988), this measure was also used in the present investigation. Each information unit in the notes that explicitly answered a true-false item was awarded a mark and those information units that answered a true-false item only partially or incompletely were awarded 0.5 points. The information units in the notes were then classified as "main" or "supporting" according to whether they helped answer main or supporting true-false questions. A maximum score of 5 could be achieved on each of these two measures, which contained five items each.

1.2 Procedure and Design

The subjects were asked to view the videotaped lecture and concurrently to take notes on the lecture material. They were allowed to take the notes in L1, if they wished. They could also refrain from doing so if they considered it would hinder their comprehension process. Once the lecture was over, the notes were collected. Immediately afterwards, and in order to check their comprehension, the subjects were asked to answer ten true-false questions, justify their answers and then complete the listening cloze test.

1.3 Results

1.4

Table 2 shows the number of items, means, standard deviations, and reliability indexes for the true-false questions, cloze test and test answerability scores. As can be seen in this table, all the measures are reliable and the cloze scores are rather low.

In order to determine if students performed better on the main true-false questions or on the supporting questions a paired t-test was conducted.

Table 2 Reliability coefficients & Descriptive statistics

| | k | Min. | Max. | Mean | s.d. | n | r. |
|-------------------------------|----------|-------------|-------------|-------------|-------------|----------|-----------|
| Student notes | | | | | | | |
| Test-answerability score | 10 | .5 | 9.5 | 3.95 | 2.82 | 42 | .85 |
| Comprehension measures | | | | | | | |
| Cloze | 20 | 1 | 15 | 7.55 | 4.04 | 42 | .80 |
| True-False | 10 | 2 | 10 | 5.20 | 2.52 | 42 | .75 |

Note: r = Cronbach's alpha; p = .05; k= number of items in the test

As can be seen in

Table 3, a significant difference was found between the students' performance on both types of questions: students achieved higher scores on main concepts than on supporting examples and ideas.

Table 3 Paired t-test on mean scores of main & supporting T/F question items

| Variable | k | Mean | s.d. | p |
|----------------------------|----------|-------------|-------------|----------|
| 'Main' T/F questions | 5 | 3.05 | 1.29 | .00 |
| 'Supporting' T/F questions | 5 | 2.15 | 1.44 | |

The student notes were then used to either confirm or refute the trend revealed by the students' performance on both groups of true-false questions. A paired t-test was carried

out to determine whether there was also a significant difference between the scores of the main and supporting notes.

The results displayed in Table 4 indicate that the mean score of the main notes was significantly higher than that of the supporting notes. These results show a parallel behaviour to the one evidenced by the two question types: students took better notes on main points than on supporting ideas.

Table 4 Paired t-test on mean scores of main & supporting note items

| Variable | k | Mean | s.d. | p |
|--------------------|---|------|------|-----|
| 'Main' notes | 5 | 2.20 | 1.58 | .00 |
| 'Supporting' notes | 5 | 1.75 | 1.41 | |

Let us finally analyse the descriptives displayed in Table in order to see the trend for each TOEFL level. As can be seen in Table 5, more proficient students outperformed low-proficiency students on both main and supporting questions and notes. The higher the student's TOEFL score the higher his/her score on both types of questions and notes. On the other hand, both more proficient and less proficient students took better notes on main points than on supporting ideas and examples and the same was the case with the T/F questions. It is also noteworthy that, although there is a high correlation between the main questions and the main notes (Pearson correlation: .78) and between the supporting questions and supporting notes (Pearson correlation: .81), on the whole students achieved higher scores on questions than on notes. This may be due to the fact that the students did not consider it necessary to take down much of the information required in the questions. It could also indicate that these students had not developed the necessary note-taking skills to follow the pace of the lecture and take notes concurrently, that is they probably did not manage to record some of the concepts they could understand.

Table 5 Descriptive statistics for different levels of proficiency

| | Proficiency levels | Mean | s.d | | Proficiency levels | Mean | s.d |
|--------------------------|--------------------|------|------|------------------|--------------------|------|------|
| Main T/F questions | 1 | 2 | .77 | Main notes | 1 | 1.09 | .78 |
| | 2 | 3.28 | 1.19 | | 2 | 2.25 | 1.5 |
| | 3 | 4 | .76 | | 3 | 3.42 | 1.54 |
| | 4 | 4.4 | .89 | | 4 | 3.9 | 1.14 |
| Supporting T/F questions | 1 | 1.06 | .68 | Supporting notes | 1 | .87 | .62 |
| | 2 | 2.28 | 1.37 | | 2 | 1.78 | 1.46 |
| | 3 | 3 | 1.12 | | 3 | 2.85 | 1.37 |
| | 4 | 4.1 | .89 | | 4 | 2.90 | 1.60 |

1.5 Discussion

The results reported above revealed that on the whole both the more proficient and the less skilled listeners in this study obtained higher scores on test items that asked for main, recurrent concepts in the lectures. Likewise they scored higher on main notes than on supporting notes. To put it simply, they apparently managed to understand some of the main concepts in the lecture by processing the recurrent linguistic input and integrating it with their prior knowledge. They found it more difficult, however, to process all the incoming linguistic input fast and accurately in order to pick examples, details and supporting ideas which are obviously not recurrent in the lecture and do not normally form part of their prior knowledge. These findings seem to indicate that these students were weaker in bottom-up than in top-down processing. And this weakness is apparently in part responsible for their rather low comprehension scores: their incapacity to fully identify relationships between concepts within the lecture hindered their full understanding of the overall development of the lecture discourse.

Other studies, however, such as that conducted by Shohamy and Inbar (1991) to study the effect of text type and question type on listening comprehension, found that less-skilled listeners performed better on “local questions”, that is questions which required the listener to identify details and facts, than on “global” questions, which required the listener to synthesise information, make inferences and draw conclusions. The reason for the difference in findings between their study and the one reported here probably lies in the location of the questions and in the nature of the local questions used: in Shohamy and Inbar’s research, the questions were administered before the students listened to the text and since local questions did not require the students to draw any conclusions or make any inferences, they knew exactly what details to listen for. In our study, however, the students were given the questions after viewing the lecture and both question types required similar levels of inferencing.

Our results, on the other hand, seem to partially confirm those obtained by Nye (1978), Tsui & Fullilove (1998) and Clerehan (1995). Nye found a small but significant positive correlation between final course grades and the number of minor points recorded in the notes and no correlation between final grades and main points. Tsui and Fullilove’s study showed that bottom-up is more important than top-down in discriminating the listening performance of L2 learners. And Clerehan’s research into the features of L1 and L2 student notes revealed that in the L2 group there was an average of 19% omission of major headings, 34% of sub-headings and 40% of legal cases—specific examples. As can be seen, the difference increases in the case of sub-headings and legal examples—which are closely related to what we term supporting notes in this study.

Going back to the analysis of our results, as already mentioned, EFL students apparently find it very difficult to process supporting ideas and examples as fast and accurately as necessary to check the schema they are developing and modify it if necessary. In order to make up for the input they miss, they tend to overrely on both the words they find more prominent and their knowledge of the world. Some examples will help us clarify this phenomenon.

In one part of the lecture, the lecturer produced the following utterances: “many tourists seek to escape the routine of their home and work. They search for holiday experiences that bring them into contact with ‘original’ cultures”. One student, probably following the schema activated at the beginning of the lecture and relying on her prior knowledge, wrote down: “tourists travel for work or for culture”. The linguistic load in these utterances apparently made her rely on key words and on her prior knowledge to complete her model of this part of the text.

On the other hand, EFL students also tend to overrely on the schema activated by the main ideas they manage to process during the lecture and seem to ignore the possibility of other ideas complementing or partially contradicting these central issues in the text. For example, the lecturer explained how many societies had decided to profit from the upsurge of cultural tourism described above by offering tourists what they wanted to see, sometimes even falsifying their history. Among the consequences of this type of tourism, she mentioned tourist wealth and explained that high-living tourists demand to eat in fine restaurants and live in luxury hotels in areas of hunger, unemployment and little opportunity for jobs or education and emphasised that these differences create resentment among the locals. One of the true-false questions the students had to answer stated that “rich tourists who travel to poor countries adapt themselves to the way of life and kind of services which are typical in those areas”. Apparently, many students could not check the schema they were developing as regards the interests of tourists who look for cultural tourism against this new incoming input emphasising the demands of this type of tourists. Therefore, they answered that the question above was true and justified their answer by saying that rich tourists travel to know and experience the culture and way of life of these places.

It is worth mentioning that these are not isolated instances, they represent—as the statistical analysis shows—common and recurrent patterns of cognitive processing among the EFL students in this study. Unfortunately, due to space restrictions, we can only provide a few examples.

In the next session we shall also analyse other aspects of these students' notes which would also seem to reflect their inefficiency in bottom-up processing.

2. EFL students' processing of connected speech: word beginnings, word endings, number of syllables, content words & function words

These EFL students' weaknesses in the rapid and accurate decoding of lexical and grammatical forms could be also considered in part responsible for the large number of confusions they made with word boundaries and consequently with word beginnings, endings and number of syllables. EFL students seem to have difficulty in perceiving function words, weak forms and unstressed syllables. In what follows, we shall provide some examples of these types of errors, as recurrently reflected in different students' notes. As Clerehan claims, investigation into note-taking needs to focus on the kind of information recorded in notes, not just the amount of information recorded (1995).

2.1 Initial sounds and number of syllables

Let us consider the following examples. Many of the students seemed to be unable to perceive the initial sounds of the words *commodification* and *acculturation*—used by the lecturer to explain the consequences of tourism—and wrote down: “modification” and “culturation” respectively. The same was the case with the word *agricultural*, which was used to describe the most common way of life in Ibiza until the 60's. About a third of the students understood “cultural” instead, most probably sticking to the schema they had activated at the beginning of the lecture. Likewise, many understood “male” instead of *female*, “important” instead of *unimportant* and “revival” instead of *survival*.

As already mentioned, EFL learners also seem to have problems in detecting the number of syllables the word has, especially in the case of unaccented positions. For instance, the lecturer talked about enclaves in *Indonesia* and most of them understood “Tunisia”. The lecturer also described the impact of tourism as being more *poignant* in hinterland communities and over a quarter of the students noted down “important”.

2.2 Word boundaries

Another source of difficulty in connected speech seems to be word boundaries, as the following examples show. The lecturer explained how in industrialised countries tourism had formerly been a *secondary activity*, which many students misunderstood as “second reactivity”. Some students also made the following slips: “keep the life” instead of *keep alive* and “social income” replacing *source of income*. A final example will help clarify the problems EFL students seem to have with word endings. One of the main objectives of the lecture was to explain how at present the cultural heritage of a society is normally seen as a *resource* which can be exploited. On hearing this utterance, over a third of the students activated the word “resort” instead, a very frequent lexical item in their ESP classes and texts.

As all these misperceptions indicate, EFL students apparently find it difficult to perceive the unclearly marked word boundaries which are characteristic of connected speech and tend to segment this continuous stream into phonological sequences which can be associated to words already stored in their lexicon. With this purpose, and as the above examples show, EFL learners, for instance, replace one or more phonemes for others,

interpret an initial unstressed syllable as an article, change the segmentation of phonological sequences, or even add a syllable to replace a function word.

2.3 Function words

Finally, we would like to make a point of the difficulty EFL students many times find in perceiving function words. The following example will help illustrate this tendency. The lecturer said that the impact of tourism was more poignant in communities located in the inner part of a country, *away from* the coast or from the banks of an important river. Most probably, on hearing these utterances, many of the students focused on the words they found more salient, that is "communities", "coast" and "river" and resorted to their prior knowledge to complete their model of this part of the text. They apparently failed to perceive the function words present in the utterance, as their answers to the corresponding true-false question and the following notes show: "the impact of tourism is higher in places in which there is coast or which are next to coast zones, because tourists prefer this kind of place, so industry of tourism is situated there". This example clearly shows how important it is to monitor developing interpretations by constantly checking them against the incoming linguistic cues.

The relevance of this type of processing inefficiency is also reflected in the next example. The lecturer explained that until the 60's, Ibiza had been predominantly agricultural and that at the beginning of the 70s hippies started arriving *from* Barcelona every week. Many students took down "hippies arrived *to* Barcelona", which clearly reflects how the misperception of a function word can lead to a serious comprehension mistake.

It is worth mentioning that in most of the cases described above students seemed to be struggling to activate words already stored in their lexicon, which sounded similar to the ones the lecturer produced, even when they made no sense in the given context. That is, their processing was apparently mainly phonological. In other cases, however, as some of the above examples indicate, they activated words belonging to the same class and semantic field, which could, to a certain extent, make sense in the given context. This fact seems to reflect how these students also integrated both phonological and semantic processing.

It should be finally noted that, given the organization of the phonological module of the lexicon (see Aitchison 1987), native speakers also have slips of the ear with words that sound similar, though these L1 problems are not too frequent. In a study devoted to the analysis of native speakers' slips of the ear in casual speech, Bond also describes word boundaries and function words as sources of misperceptions (1999). As she clearly explains, these occasional errors tend to be the result of inattentive listening. In the present study, however, the students listened to a lecture of the reading style which, given its level of formality and the lecturer's awareness of the students' level of proficiency, showed a smaller number of reductions and simplifications than those common in casual speech. Thus, the misperceptions described above, which are usually recurrent and sometimes surprisingly identical among the subjects in this study, do not seem to reflect their lack of attention, but their limited vocabulary coupled with their problems with bottom-up processing.

3. General conclusions

The experiment described in this paper seems to suggest that EFL university students' speech comprehension problems might in part be due to their inefficiency in bottom-up processing although, given the exploratory nature of this investigation, the findings presented here are not meant to be generalised to larger samples but just to reveal possible trends worth examining in further research. As the results show, both the high-proficiency and low-proficiency students in this study were weaker in bottom-up than in

top-down skills. Generally speaking, these students did not seem to have difficulty in relating and integrating what they were viewing with their prior knowledge—a skill they most probably transferred from L1. Furthermore, they seemed to overrely on this type of processing to make up for their lack of facility in decoding all the linguistic input they received rapidly and accurately. Thus, their tendency to build schematic models of different portions of the lecture based on the main ideas they managed to process or on the integration of the content words they found more prominent with their background knowledge. Obviously, these strategies resulted in many comprehension problems as the above examples show, which, needless to say, were augmented by their poor vocabulary and the weak links and associations in their lexicon.

The statistical results reported above would also seem to be supported by these students' difficulty in perceiving word beginnings, endings, number of syllables and function words.

4. Implications for pedagogy

Given the exploratory nature of the findings reported above, care should be taken in relating them to strict pedagogical practices. Nevertheless, we believe they can be used as indicative of possible trends for the teaching of EFL listening, academic listening and note-taking worth contrasting with further evidence.

To begin with, it seems very important to train EFL students to develop their listening skills before or upon entering university if they are to profit from academic listening not only as a source of language input but also of specific content of the discipline. Those students who are weak in listening comprehension are at a decided disadvantage as far as their academic and professional development is concerned. This is unfortunately often the case with many EFL learners, given the difficulty of training students in this skill (Chaudron 1995) and the neglect listening usually suffers in most language programmes.

The findings reported above as well as those obtained by Tsui & Fullilove (1998) seem to indicate that the enhancement of bottom-up skills is essential for academic listening success. We believe that EFL programmes should instruct students to develop these skills from the beginning of L2 learning. Although it is usually claimed that students should be trained to get the gist of the listening passage, we consider that this type of practice, which is undoubtedly advisable, should not be fostered at the expense of others aimed at improving students' bottom-up skills. The examples reported above provide evidence of the danger of resorting mainly to top-down processing, especially in the case of more specialised passages, such as lectures, where the students' prior knowledge of the subject area tends to be relatively scarce. As Eskey states, bottom-up skills should be mastered to take much of the guesswork out of reading (1988), and we believe the same applies to listening.

One possible solution for this inefficiency—apparently so common among EFL university students (Clerehan 1995; Tsui & Fullilove 1998)—could be to include dictations in EFL programmes from early stages on. Although this practice seems to have fallen in disuse with the advent of communicative and task-oriented methodologies, it can prove very helpful, as US programmes for ESL students seem to show (Dunkel 1988), to prevent the type of difficulties described above. Needless to say, the mastery of both bottom-up and top-down skills is essential if EFL university students are to profit from content-based programmes.

Another type of practice which could also be implemented in EFL programmes is presenting students with passages which initially make them activate schemata which are later on disconfirmed by the incoming linguistic input, and so in this way make students aware of the need to revise their predictions and interpretations. It also seems important to start training students with short passages, where the scarce context forces them to rely mainly on the syntactic, morphological and lexical cues in the given

utterances in order to assign meaning and construct the model of the text.

Finally, a last point is worth making. Considering that both L1 and L2 students intuitively resort to note-taking when presented with spoken academic discourse (Rothkopf 1970) and that the analysis made in this study revealed very poor note-taking skills, it might also be useful to teach students who are undergoing academic studies, to improve their note-taking skills, as is being increasingly done in other L2 environments (Dunkel 1988; Mulligan et al. 2000). Many of our students use their notes mainly for external storage: that is, they tend to record mainly incomplete verbatim information, sometimes without any cognitive processing for comprehension. Hence, instruction in this area seems essential. It should not be forgotten that note-taking, if properly exercised, can be an effective strategy to increase students' recall, comprehension and retention of subject matter (Dunkel 1988; Faber et al. 2000; Trafton & Trickett 2001).

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