The Effect of Implementing Cornell Note-Taking Strategies on New Students’ Performance in Listening Comprehension

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Abstract—This study investigated the effect of employing Cornell note-taking strategies to improve new students’ performance in listening comprehension at Albaha University in the Faculty of Science and Arts, Al Mandaq. The study's population consisted of 40 first-year male students enrolled in the preparatory year program for various science subjects, including Physics, Chemistry, Biology, and Mathematics, in the academic year 2021–2022. These students were enrolled in a listening course, making them suitable candidates for the study. They were divided equally into two groups: the control group and the experimental group. The experimental group underwent a training program using Cornell note-taking strategies, while the control group received no training and just completed the course as normal. The data was obtained and framed using a descriptive qualitative method. To collect the data, a pre-test and post-test were designed to measure the students’ performance before and after the training program. The data was then analyzed using the SPSS program. The findings revealed clear progress in the performance of the experimental group compared to the control group. The poor performance of the control group was attributed to their lack of knowledge about note-taking strategies and their insufficient practice of and feedback on Cornell note-taking strategies.

Index Terms—Cornell note-taking strategies, listening comprehension, listening classes, preparatory year program, Albaha University students

I. INTRODUCTION

Notes are condensed summaries of source material, typically created by recording information as it is being conveyed by listening, studying, or observing (Kiewra et al., 1989). They serve as a means of gathering information during various learning situations, such as lectures or when reading books. In essence, they act as external memory aids that feature more or less explicit content.

Note-taking can be challenging, often resulting in inadequate notes or missing information, which is a common issue among students (Zuckerman, 2016). This is a problem that needs to be addressed because learning note-taking techniques is crucial for students, as it enables them to retain knowledge that they would otherwise forget. Effective note-taking involves more than just recording everything heard; it also entails accurately summarizing critical ideas in one’s own words, drawing connections between concepts presented in different lectures and lessons, and writing down any questions that come to mind in order to enhance comprehension and clarity (Blog, 2018).

The actual setting or context in which instruction and note-taking take place is a crucial factor in determining how effectively one learns while taking notes (Ertmer & Ottenbreit-Leftwich, 2013). Even though a classroom is the most typical place to take notes since it offers more immersive and engaging benefits than other settings, potential distractions may affect a student’s ability to learn and take notes from other students. Moreover, in regard to studying and taking notes during lectures, many students frequently struggle. These challenges often manifest as difficulties in staying focused during lectures, keeping up with the fast pace of the material, comprehending one’s notes after class, ensuring readability, and deciding what information is most important to record. These issues frequently lead to incomplete or partial lecture notes (Tolliver, 2017).

The notes that students take in class or while studying for a test are crucial learning resources. Many students and teachers see note-taking as a straightforward and intuitive talent, but few consider the practices required to optimize note-taking. Ironically, many students are either unaware of the benefits of effective note-taking or do not understand why they should learn how to do it throughout their academic careers. Taking good notes may help students to stay focused in class, improve study habits, achieve higher scores, and remember more of what is read. A clear demonstration of the significance of notes is that students predominantly rely on memorization of notes while studying for high-stakes tests (Morehead et al., 2016).

Given that notes serve as the foundation for what students learn, it is critical to understand where and when students take their notes and the strategies they use to review their notes to increase recollection and retention of the course
Students struggle the most with taking complete and understandable notes, as evidenced by the work of Oppenheimer (2016) and Numazawa & Noto (2016). Technology may affect students' ability to recall and apply the knowledge they acquire in class (Grahame, 2016; Mueller, 2016). The increase in the use of computers for note-taking during lectures has led to concern about how this new technique and style of note-taking impacts learning. Notes are typically hand-written or typed on a computer, but, due to the recent growth in technology, some students may be more inclined to use digital devices. The advantage of digital note-taking is its portability, as students can review notes later from their devices. However, there is evidence that traditional hand-written notes are more effective for academic performance. People take notes for multiple purposes, including learning, improving long-term memory, and engaging in critical thinking. Studies exploring the link between note-taking and the retention of lecture content have led to modifications in the technique and style of note-taking. Notes are typically hand-written or typed on a computer, but, due to the recent increase in the use of computers for note-taking during lectures, researchers have grown concerned about how this new technology may affect students' ability to recall and apply the knowledge they acquire in class (Grahame, 2016; Mueller & Oppenheimer, 2016; Numazawa & Noto, 2016).

Note-taking is a challenging task (Nakayama et al., 2017). Students struggle the most with taking complete and correct notes, recalling lecture subjects and details, and concurrently writing them down with a suitable degree of linguistic competence. In addition, the limited vocabulary of EFL students and the intense mental stress required on their part while taking notes can have a negative impact on both the quality of the notes they take and their exam performance. In other instances, students may lack the required abilities to take appropriate lecture notes and therefore ask for the teacher's help. The teachers must offer to help these students with note-taking and encourage them to identify crucial points addressed during class (Jacobs, 2014).

Objectives of the Study
This study investigates the effect of employing Cornell note-taking strategies on improving new students' performance in listening comprehension at Albaha University Faculty of Science and Arts. More specifically, we assess the effect of employing Cornell note-taking strategies on listening comprehension; describe various types of note-taking; shed light on note-taking sequences in learning; emphasize the significance of note-taking in long-term success; and make recommendations regarding how to raise students' performance in listening comprehension. To address these objectives, we formulated the following research questions and derived three hypotheses based on them.

Research questions:
Q1 Do students use Cornell note-taking strategies in listening classes?
Q2 Are students aware of the relationship between note-taking strategies in listening classes and academic success?
Q3 Why do students struggle in listening comprehension classes?

Hypotheses:
H1 Students do not employ Cornell note-taking strategies in listening classes.
H2 Students are unaware of the relationship between note-taking strategies in listening comprehension classes and academic success.
H3 The difficulties that students face in listening comprehension classes are due to many factors.

II. LITERATURE REVIEW

According to studies on how individuals acquire a second language, numerous note-taking techniques can be employed to assist, arrange, and recall information from classroom lectures. An infallible methodology of six practical note-taking approaches is as follows (Pauk, W. & Owens, R.J.Q, 2013):

Outlining Note-Taking Method
It is a common practice to use bullet points and indentation while outlining (Hayati & Jalilifar, 2009). There is no need to use integers, alphabetic letters, or Roman numerals. The first step calls for taking careful notes by listening meticulously and indenting each subject in the correct sequence. The left side of the graph is where most of the time and effort should be concentrated. An extra right-justified indentation is required for each successive level of detail. The simplicity of this technique, which requires minimal modifications and can be examined rapidly, is one of its fundamental characteristics. However, more in-class preparation is necessary for its implementation, and the method cannot be applied if the material that needs to be absorbed is being presented too quickly.
Charting Note-taking Method

If the structure of a lecture or lesson is understood, the chart note-taking method can be used. This technique involves organizing the document in the form of a table by drawing columns and labeling suitable headers. While listening to the lecture, the students organize acquired information such as words, sentences, and important concepts in order to keep track of chats and dialogues, thereby reducing the amount of required writing. This method provides an efficient way to review your notes, making them suitable for memorization, as well as for making comparisons and connections between different pieces of information (Thomas, 2021).

Mapping Note-taking Method

Mapping is a unique form of note-taking that connects each fact or concept to every other piece of information or concept, thereby creating a graphical representation of a lecture's content. It is a strategy that optimizes active engagement, facilitates instant comprehension, and stresses critical thinking. This approach allows one to visually follow the lesson regardless of the environment. There is no mental effort required, and connections are readily apparent. In addition, it is simple to alter notes by adding numbers, symbols, and color-coding. The main ideas may be written on flash or note cards and assembled into a table or broader structure and reviewed by reviewing lines and connections for memory drills.

Sentence Note-taking Method

This note-taking method requires students to number each new idea, piece of information, or subject as they write it on a separate line. This approach results in a well-organized set of notes that is more structured than traditional paragraph-style note-taking. However, the sentence technique cannot discern major/minor points from the numerical sequence and the full extent of the lecture's organization and structure may not be immediately clear until the notes are reviewed and connections are refined through editing. This technique is typically used when the lecture is well-organized but contains a large amount of information.

Cornell Note-taking Method

The Cornell note-taking method is presented in a manner that should be easily understandable for any student. This line of investigation tries to address whether this kind of note-taking helps students retain the concepts that are presented during class lectures. For this evaluation, a tried-and-tested technique that takes a more comprehensive approach was selected: the Cornell method (CM). When it was initially designed, its principal purpose was to simplify the note-taking process for Cornell University students. A standard Cornell note-taking template is provided in Table 1. This practice provides systematic frameworks for both note-taking and analysis. Students who are just beginners in note-taking and want to avoid wasting time and effort on irrelevant information will profit immensely from this method since it makes it easy to extract the most important words and ideas. The Cornell system is both a note-taking and a study system. It consists of six steps:

- **Record**
  Prepare notepaper, summarize, paraphrase, and indicate topic changes.

- **Question**
  Formulate test questions based on the information recorded in notes and write them in the recall clues column on the left-hand side of the notes.

- **Recite**
  Recitation means explaining the information in the notes in your own words. This improves learning, ensures understanding, and facilitates retrieval.

- **Reflect**
  Reflection is the act of drawing insights from the material learned.

- **Recapitulate (summarize)**
  Write a summary of the main ideas using your own words.

- **Review**
  A good guideline is to review your note several times during the week by reciting, not merely reading, them.

Sketch Noting Method

Also known as graphic notes or visual note-taking, sketch noting, as its name suggests, is the practice of taking textual notes that are embellished with images, symbols, structures, doodles, and basic drawings (Bell, 2015; Neill, 2019). Drawing is not only enjoyable and stimulating but has been demonstrated to be a more effective method for improving memory and later retention than writing alone (Wammes et al., 2016). Additionally, including visuals in note-taking should be a highly enticing notion (Elmore & McPeak, 2017). When done correctly by either students or teachers, sketch notes not only record ideas but also convey a narrative.

It is important to highlight that many students have adapted their note-taking strategies by incorporating digital tools. Instead of using traditional notepads, they now rely on note-taking applications on computers or mobile devices. However, interestingly, traditional note-taking methods, like photos of the text on the board, are still being used. This demonstrates that note-taking has remained popular despite the rapid advancement of technology (Hseyin & Okan, 2019). Indeed, a survey on note-taking practices conducted between 2012 and 2013, which involved 99.6 percent of 435 university students, found that 93.8 percent of them frequently took notes (Peverly & Wolf, 2019). Moreover, 53.4 percent of survey participants said they sometimes took notes on a computer, but as many as 96.5 percent of students...
said they took notes on paper occasionally.

Some academicians support taking notes on a laptop instead of paper when attending a university. Students have a variety of note-taking options, including typing notes on a laptop or tablet or taking notes longhand in a notebook, or utilizing an electronic device. When studying which method is most effective in real-world classes, taking notes by hand has typically resulted in performance outcomes that are as good or even better than digital alternatives (Carter et al., 2017; Peteranetz, Mueller & Oppenheimer, 2016).

Surprisingly, though, one study found that laptop note-taking resulted in improved memory test performance (Schoen, 2012). Additionally, an interaction effect was also observed, which revealed that typing notes during lectures resulted in better performance, while longhand note-taking during lectures resulted in worse performance. No difference in memory performance existed between note-taking methods when the course material was provided as text. A plausible explanation for this interaction effect is that no new information is supplied while taking notes from the printed text (Aragón-Mendizábal et al., 2016). Further information is offered only while listening to a conversation or watching a video lecture. This means that students must split their attention between listening to the lecture and taking notes, so, given that typing notes is faster than writing them by hand, typing on a laptop may be more effective for recording information.

The benefits of note-taking

Taking notes provides students with several significant advantages. It allows them to avoid the necessity of reading an entire book (Bahrami & Nosratzadeh, 2017; Saravani, 2019; Umaadevi & Rekha, 2019); it improves their cognitive abilities by drawing their attention to the reading or listening material, which prevents them from missing any of the information presented in class; it promotes independence; and it helps students retain crucial information. As in the example mentioned earlier, 96.5 percent of students indicated they took notes on paper sometimes, while 53.4 percent of survey participants claimed they took notes on a computer occasionally. Thus, note-taking can help students excel in listening and recalling consequential details about the subjects taught, as well as improving their writing skills through a variety of note-taking options, including typing notes on a laptop or tablet or taking notes longhand in a notebook, or utilizing an electronic device. When studying which method is most effective in real-world classes, taking notes by hand has typically resulted in performance outcomes that are as good or even better than digital alternatives (Carter et al., 2017; Peteranetz, Mueller & Oppenheimer, 2016).

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The overview section should also assist in determining which details require clarification.

<table>
<thead>
<tr>
<th>Recall Clues</th>
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<td>• Utilize concise sentences to summarize important information.</td>
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<td>• Produce and draft credible study material.</td>
<td>• Any content, including illustrations, issues, and solutions.</td>
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<td>• Include verbal examples, questions, and answers.</td>
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<td>• Include any relevant, remarkable comments.</td>
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**TABLE 1**

**CORNELL NOTE-TAKING FORMAT SAMPLE (CENTRE, 2002)**

- Encourages critical thought regarding the issue at hand.
- It may contain words, equations, problems, answers, diagrams, and drawings.
- The overview section should also assist in determining which details require clarification.

The benefits of note-taking

Taking notes provides students with several significant advantages. It allows them to avoid the necessity of reading an entire book (Bahrami & Nosratzadeh, 2017; Saravani, 2019; Umaadevi & Rekha, 2019); it improves their cognitive abilities by drawing their attention to the reading or listening material, which prevents them from missing any of the information presented in class; it promotes independence; and it helps students retain crucial information. As in the example mentioned earlier, 96.5 percent of students indicated they took notes on paper sometimes, while 53.4 percent of survey participants claimed they took notes on a computer occasionally. Thus, note-taking can help students excel in listening and recalling consequential details about the subjects taught, as well as improving their writing skills through a range of methods and techniques (Walker et al., 2017; Roy et al., 2016). Taking notes provides more than a transcript of a class discussion or lecture (Slotte & Lonka, 2003); it is a crucial study tool that offers the following benefits:

**Enthusiasm**

Taking notes keeps the body active and engaged, which in turn keeps the mind alert and prevents feelings of exhaustion or distraction.

**Promotes notion**

Note-taking actively engages the mind in the content being presented. By paying close attention and choosing what to include in their notes, students become more involved with the material.

**Classified material**

Organizing notes by selecting and highlighting essential information, and underlining supporting topics within a presentation, makes it easier to draw connections between what is learned in class and what is read in the textbook.

**Concise research archive**

A series of concise, well-organized notes from each class session provides everything needed to study, learn, and review after class.

It might even be claimed that note quality cannot be appraised by anybody other than the user of the notes, as a specific note format suitable for one person may not be the most effective or suitable means of conveying content for another (Bui et al., 2013). Moreover, the process of encoding knowledge into words or images creates new neural connections in the brain, which strengthens its storage in long-term memory, as opposed to information simply being passively absorbed (Gonzalez, 2018). Storing information in new areas of the brain in this way allows for easy retrieval and reinforces the retention of acquired knowledge. In general, one of the most important things teachers can do to help students take notes is to provide material in a clear and structured manner. The organizational structure of the content must be understood not only by the instructor but also by the students (Reynolds & Tackie, 2016). One method to accomplish this is to give students guided notes that make the organization clear to them. This might be as simple as an outline with space for students to write notes to solve example issues.
III. METHODOLOGY

Participants
This study involved 40 participants who were students in the preparatory year program at Albaha University, specifically from the Faculty of Science and Arts in Almandaq. These students take a listening and speaking course, which aligned perfectly with the focus of this study. The participants were randomly selected and divided equally into two groups: the experimental and control groups. The age range of the participants ranged from 18–19 years, and they had each studied English for approximately eight years. Therefore, it was assumed that the participants’ proficiency levels would be equal. The research was conducted in the academic year 2021/2022. In the experimental group, the researcher and other college instructors took part in the note-taking program, while the control group was taught the regular English course by their usual instructors.

Data Collecting Tools
For this study, the following instruments were carefully chosen to collect the necessary data:

Pre-listening test
The pre-listening test was administered for both groups. The students listened to the audio material twice and answered the twelve written multiple-choice questions. The achievement of both groups was documented for further investigation and manipulation to obtain reliable data. With appreciated cooperation from the department staff, the researcher conducted the test.

Post-listening test
Before running the post-listening test, the experimental group received explicit learning and training using the Cornell note-taking method during listening classes. The control group, by contrast, did not receive any kind of training with respect to taking notes and participated in the course as normal. The post-listening test was the same as the pre-listening test and was conducted for both groups. By employing the SPSS program, the result of the post-test was documented, analyzed, and compared to the result of the pre-test to determine whether there was any difference between the performances of the two groups.

IV. DATA ANALYSIS

After completing the analysis and manipulating the data, the following results were produced:

Pre-listening test
The test was carefully designed to meet the needs of the study. It was driven by an audiobook, Graded Reader. The listening passage entitled Mr. Bean in Town included short conversations (Appendix). The listening material was selected wisely to suit the students’ level. The students listened to the passage twice and then answered the questions.

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Figure 1. Pre-Listening Test of Experimental and Control Groups

Table 2 and Figure 1 show the performance of the control and experimental groups in the pre-listening test. The student’s scores across the two groups were broadly similar—that is, the participants did not score high grades on this test, which means they were unfamiliar with note-taking strategies.

The highest correct score for the control group was 58.33% (for questions 1 and 3); the lowest score was 25% (for questions 6 and 9). For the experimental group, meanwhile, the highest score was 58.33% (for question 8), while the lowest percentage was 16.66% (for question 6).

On the other hand, the highest incorrect percentage for the control group was 66.66% (for questions 7 and 10), while the lowest percentage was 41.66% (for question 1). Concerning the experimental group, the highest incorrect percentage was 83.33% (for question 6), while the lowest percentage was 41.66% (for question 8).

Generally, variation in the performance of the two groups was not expected. However, the process was only designed to compare the early achievement of the students across the two groups.

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Figure 2. Post Listening Test of the Control and Experimental Groups

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<td>7.58</td>
<td>4.75</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5.21</td>
<td>6.79</td>
<td>6.21</td>
<td>6.04</td>
</tr>
</tbody>
</table>

Post-listening Test
As indicated in Table 3 and Figure 2, there was a substantial difference between the students’ pre-test and post-test performances. Students in the experimental group outperformed those in the control group on the post-test. However, the control group’s ability to take notes did not improve because they received no guidance on how to do so. Apparent progress was expected in the performance of the experimental group due to the training program that they received in employing Cornell note-taking strategies in listening classes. Table 4 demonstrates the mean for the two groups in the pre- and post-tests. In the control group, the mean of correct answers in the pre-test was 5.17, while it was 4.83 in the post-test. This reveals that there was no apparent progress in the students’ performance. In the experimental group, meanwhile, the mean of the correct answer in the pre-test was 5.25, and in the post-test it was 7.58, indicating considerable improvement in the students’ performance.

ANOVA Computation
The ANOVA computation conducted in this study involved a comparison of four means. Two of these means represented the correct and incorrect means of a pre-test, while the other two means represented the correct and incorrect for a post-test of the two groups (Table 5).

<table>
<thead>
<tr>
<th>MEAN BETWEEN GROUPS</th>
<th>SUM OF SQUARES</th>
<th>DF</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>SIG.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct scores of the control group in the pre-test</td>
<td>0.042</td>
<td>1</td>
<td>0.042</td>
<td>0.029</td>
<td>.867</td>
</tr>
<tr>
<td>Incorrect scores of the experimental group in the pre-test</td>
<td>0.042</td>
<td>1</td>
<td>0.042</td>
<td>0.029</td>
<td>.867</td>
</tr>
<tr>
<td>Incorrect scores of the control group in the post-test</td>
<td>40.042</td>
<td>1</td>
<td>40.042</td>
<td>15.477</td>
<td>.001</td>
</tr>
<tr>
<td>Correct scores of the experimental group in the post-test</td>
<td>45.375</td>
<td>1</td>
<td>45.375</td>
<td>21.429</td>
<td>.001</td>
</tr>
</tbody>
</table>

The computation of ANOVA for the post-tests revealed a statistically significant difference between the total means of correct and incorrect scores of the pre-test of the experimental groups, with a p-value of 0.001. However, the computation of the pre-test does not show any statistically significant difference between the total means of the correct and incorrect scores in the control and experimental groups because of the p-value of 0.867, which is more than the proposed value of 0.05 / 0.001. These results indicate the consistency in the performance of students in the post-test in comparison to their performance in the pre-tests, which may be attributed to the training they received.
V. DISCUSSIONS

This research set out to demonstrate how Cornell note-taking strategies affect students’ achievement in listening comprehension classes. To effectively perform the research, precise hypotheses were generated in order to make the results more realistic and authentic.

According to the first hypothesis, the students did not employ Cornell note-taking strategies in listening classes. To investigate this hypothesis, a listening test was designed to determine whether the students had pre-knowledge about Cornell note-taking strategies. The test results were poor and demonstrated that the students had not employed such strategies in listening classes. The second hypothesis posited that the students were unaware of the relationship between note-taking strategies in listening comprehension classes and academic success. This hypothesis was evaluated through a written test, which revealed that many students selected the incorrect option because they had not been taking notes during listening activities. The third hypothesis suggested that students’ difficulties in listening comprehension classes are due to many factors. According to the test results and the students’ performance, it was indeed found that miscellaneous factors were accountable for the students’ poor achievement. Students were observed to be unconcerned about taking notes during listening comprehension classes and to demonstrate a lack of focus and concentration. It was also evident that students needed more exposure to note-taking techniques, as they had not been previously familiar with them.

VI. CONCLUSION AND SUGGESTION

The outcomes of this study show the extent to which students apply Cornell note-taking approaches. It was found that neglecting the use of these techniques in listening classes is a common occurrence among students. The results also revealed that many students are unaware of the relationship between note-taking strategies in listening classes and academic success, leading them to encounter difficulties in listening classes. Therefore, teachers should allocate considerable time for students to practice note-taking techniques to improve their learning. To do so, the syllabus designers must introduce more topics on note-taking strategies for teachers. In this way, learners of English-related skills and other subjects can acquire valuable skills and reap the benefits of faster learning. The note-taking process is one of the most critical aspects of conducting listening classes effectively and accurately.

APPENDIX

Pre- and Post-Listening Test

https://www.youtube.com/watch?v=zPjEMwK5d9Y

1- How could Mr. Bean make his birthday an important day?
   a- He went to the beach   b- He stayed at home
   c- He celebrated with a friend   d- He went out to a restaurant
2- Did Mr. Bean often eat in restaurants?
   a- Yes, he did   b- No, he didn’t
3- How did Mr. Bean prepare himself for that evening?
   a- He invited his friends   b- He had his hair cut
   c- He put on new clothes   d- He lent money
4- Where was the restaurant?
   a- In the center of the town   b- In the outskirt of the town
   c- By the beach   d- In the dreamland
5- When did Mr. Bean arrive at the restaurant?
   a- At seven o’clock   b- At eight o’clock
   c- At nine o’clock   d- At ten o’clock
6- How was the restaurant look like?
   a- It was horrible   b- It was very nice
   c- It was dirty   d- It was untidy
7- Where did the manager meet Mr. Bean?
   a- At door   b- In the yard
   c- In the car parking   d- In the hall
8- How did the manager behave?
   a- Politely   b- Carelessly
   c- Impolitely   d- Arrogantly
9- What did Mr. Bean take out of his pocket?
   a- A cigarette   b- A sweet
   c- A flower   d- A birthday card and an envelope
10- What did Mr. Bean write on the card?
a- Happy birthday my friend  b- Happy birthday Bean

c- The cost of the dinner  d- A complaint

11- What did Mr. Bean pretend to see?
a- The manager  b- The waiter
c- The card  d- The menu

12- Did Mr. Bean seem to have friends?
a- Yes, he did  b- No, he didn’t

REFERENCES


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