Paper or Digital: Which Format Most Helps Students?

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Reference Data:

This paper summarizes a 2-year research project dealing with online listening activities developed using authentic sources from Internet sites such as YouTube, NPR, and the BBC, and listening materials created by the authors. The goals of the project were to give students more practice to develop listening skills, more autonomy, and more empowerment, and to foster independent learning. Due to changes in how we administered this project, a final goal was to evaluate whether Moodle activities or paper handouts were more effective in helping students improve listening skills. This paper explains the motivation and background of this project, how the project was administered, the results from pretests and posttests, the number of activities completed per student, and which format—paper or Moodle—encouraged a consistency of effort from students.

Listening skills have long been considered the most used of the four skills (White, 2006). In fact, one estimate suggested that listening is used twice as much as speaking skills, and four to five times as much as reading and writing skills (Rivers, 1981). Furthermore, Burely-Allen (1995) contended that business executives spend as much as 40% of their time listening, while Mendelsohn and Morley (1995) believed that adults spend about 50% of their time listening. However, despite its importance, it was also noted that listening is often overlooked in language classrooms (Nunan, 1997b; White, 2006). For this reason, the authors created an online, open access series of listening activities that were used at two universities in Japan. The project goals were initially to provide students with additional exposure to English outside the classroom, improve students’ English language proficiency, and foster student autonomy and independent learning.

During the 2-year study, we also had an opportunity to evaluate whether it was more beneficial for students to complete the online activities by paper or by Moodle. To evaluate the effectiveness of the project and which was more effective, paper or Moodle, we examined students’ pretest and posttest scores and the number of activities students completed. Similarly, we hoped that the project would reveal the relative merits of each method. In the end, we had
three research questions:
(a) Does the method by which materials are delivered to students affect their ability to master the material?
(b) Which method is more effective, paper or online, in improving students' listening skills?
(c) What are the benefits and shortcomings of each method?

Methods (1st Year)
We decided to call our project the Listening Flood project mimicking extensive reading programs being called *reading floods*. In the 1st year, even though we were using paper-based materials, we wanted the distribution and students' selection of the materials to take place outside of the class. For this reason, we went to wikispaces.com, an online web service that allows teachers and educators to make free wiki and web pages. We created a website with the Listening Flood name and used it as the place where students could access the materials they would need to complete the project. The website is available at the following URL: http://listeningflood.wikispaces.com. We chose Wikispaces as our online platform because it is easy to use for both administrators and teachers, it is free, and it is easily accessible from home or university.

Students who visited the website found links and materials for a variety of listening activities organized into different listening skill categories. Categories included: songs, video lectures, audio lectures, short news passages, true/false questions, multiple-choice questions, and applied listening questions. Students would click on a category and be taken to a page of activities focused on that skill. Many of the category pages of the Listening Flood website included links to sound and video files available from sites such as YouTube, NPR, and the BBC or sometimes audio files that we had created on our own. Also, we prepared a worksheet of questions and activities for each sound file or video link, and these were available for download from the Wikispaces' page.

As we imagined the project, students would visit the Listening Flood page each week. They would select a skill category that they wanted to practice. From the skill page they would choose an activity. Students would download the worksheet, a Microsoft Word document, and then open the link to the sound or video file for that worksheet. Students would listen to the sound or video file and write the answers on the worksheet.

To provide practice in a variety of listening skills and strategies, we used seven types of listening materials and created ten units for each. We tried to include materials that were relevant, authentic, comprehensible, and provided both top-down and bottom-up processing. We also tried to cover the following range of listening strategies:

- general comprehension,
- listening for details,
- identifying words and discourse markers,
- recognizing rhetorical structures,
- making inferences,
- connecting vocabulary to other linguistic features for meaning,
- using nonlinguistic clues such as gestures and facial expressions for meaning, and
- applying analytical thinking skills.

Much of the literature on teaching listening (Dunkel, 1986; Mendelsohn, 1991; Mendelson & Morley, 1995; Morley, 1991; Peterson, 1991; Rost, 1991; Rubin, 1995) highlights the importance of the above criteria and the range of listening skills essential for developing better listening ability. To target this range of listening strategies, we selected songs, video lectures, audio lectures,
short news passages, true or false questions, multiple-choice questions, and applied listening questions as described below.

**Description of Listening Materials**

Each of the listening units had either a sound or video file and an accompanying document which students could download or print with that unit’s listening task. The categories included songs, video and audio lectures, short news passages, true or false questions, question and answers, and applied listening questions.

The first category of materials was songs. The audio materials in these activities were mainly videos from YouTube. The songs were 2 to 3 minutes in length and the worksheet task was to complete cloze (gap-fill) exercises for identifying individual words, common collocations, verb tenses, and transitional devices, and recognizing linked and blended words. Students of English as a second language often expect each word to be clearly enunciated as an individual unit, but natural spoken English occurs at a rapid speed, and students need practice identifying blended and linked sounds (Rogerson & Gilbert, 1995), which the cloze exercises provided. The songs were also chosen to stimulate their interest in the project.

The second category of activities that used the cloze technique was the short news passages. These audio sound files (1 to 2 minutes in length) were created by the authors and a third colleague. The content dealt with current events and interesting facts, such as immigration in Japan, language extinction, and the inventor of *Cup Noodles*. These cloze exercises required students to use their grammatical, semantic, and rhetorical knowledge of the language (Oller & Conrad, 1971). For more information on using cloze and dictation talks, see Oller (1979) and Radice (1978).

The third and fourth categories of activities were video and audio lectures. The video lectures (5 to 10 minutes in length) were again taken from YouTube and dealt with such topics as global warming, engineering, manufacturing, construction, consumer electronics, and simple chemistry experiments. None of the videos were designed for ESL students, so they provided an opportunity for students to experience authentic English. The videos were all documentaries, and were selected because they followed suggestions by Sherman (2003) regarding having only one speaker speak at a time and avoiding regional or nonstandard accents.

While the video lectures featured authentic videos from YouTube, the audio lecture sound files were created by the authors. The worksheet tasks included traditional ESL materials covering topics like the effects of global warming, the lifestyles of Canadian teens, and a technical description of a soccer goal. Both the video and audio lecture activities focused students’ attention on key events or statements to aid comprehension, and provided practice in listening for gist, understanding main ideas and supporting details, recognizing rhetorical structures, and identifying inferred information. The video lectures also provided students an opportunity to use nonlinguistic clues for meaning and make predictions. Matching opinions or statements to speakers and identifying key names, dates, or events were common tasks.

The question & answer section was the fifth type of category available on the website. The questions followed the format used by TOEIC in its dialog problem section. In each dialog, the first speaker asked a question and a second speaker offered three responses. Students chose the response that best matched the first speaker’s question. A number of skills were being tested by this type of activity. Students had to distinguish similar sounds, understand the vocabulary of the situations, infer information, and choose grammatically appropriate responses. The question & answer sound files were written and recorded by the authors. The TOEIC-style questions (1 to 2 minutes in length for
five questions) were included because of students’ high interest in taking TOEIC and were also similar to the questions used on the pretest and posttest.

The true or false sound files (1 minute in length for five questions) were the sixth category and were also created by the authors. The questions were based on vocabulary activities for elementary school age native speakers. Students heard a short statement, such as:

Lizards are mammals.

Students needed to understand the vocabulary items and evaluate if the statement was true or false. The activity was designed to improve students’ ability to listen for detail and their listening comprehension speed.

The final category was applied listening. These questions (30 seconds in length for one question) were one of the most difficult, but more unique, type of activities available for students. In these activities students heard a short story problem involving a simple mathematical calculation, such as:

Mr. Suzuki starts work one half hour after Ms. Tanaka. Ms. Tanaka starts work one hour before Mr. Yamanaka who starts at 8:30 am. What time does Mr. Suzuki begin work?

The applied listening questions were intended to help students develop note-taking skills. As described by Simmons (1984), story problems provide students with practice evaluating what information is important and then manipulating that information to reach a verifiable goal or conclusion.

**Procedure with Paper-Based Assignments**

In the beginning of the term, we administered a 50-question TOEIC pretest. The test had no effect on students’ grades and students were never told their results. We then assigned students homework on the Listening Flood website. For the first assignment we choose three units for students to complete: Song 1, Audio Lecture 1, and Short News Story 1. Students were to print and complete the worksheets for these units and bring them to class the following week. We assigned these units so that students could sample different materials and so that we could later discuss in class how students approached the listening tasks, what strategies they used, and how they managed with the website, and also deal with any problems students might have had with opening the sound and document files. This procedure also served to reduce anxieties students might have with computer-based learning (Peterson, 1997). Finally, we went over the answers in class and collected the homework.

For the remainder of the semester students were encouraged to go to the website as often as they wished and to choose whatever units they wanted. Thus, students could decide for themselves what units to do (or not do), when to do them, the order to do them in, and how to do them. However, students were encouraged to limit themselves to one unit a day and to do multiple units a week. The grade students received for the project was based on the average number of units the students completed per week (1 unit a week = C; 2 units a week = B; 3 units a week = A; 4 units a week = A+). It was hoped that by giving students power to decide what grade they would receive for the project, student motivation would also increase (Maggore & Gardner, 2003; Nunan, 1997a) and that this motivation would further promote improvement in their overall language proficiency (Benson & Voller, 1997; Little, 1991). We also wanted to test whether more exposure to English would translate into more improvement in students’ listening ability (Krashen, 1985). It was hoped that the more frequently students accessed the website, the more improvement they would display on the posttest at the end of the semester.
In this way it was hoped that the online Listening Flood project would avoid some of the problems inherent in in-class listening tasks—mainly a lack of control over the recorder and lack of control over the type of interaction with the materials (Anderson & Lynch, 1988; White, 2006). Students in the Listening Flood project could listen to the material as often as they wanted, could stop and listen to sections of it, or could stop to check their dictionary or to research a mathematics formula. By doing so, we felt students could interact more with the material, be more active learners, and have lower levels of anxiety (Egbert, 2002; Kern, 1992). There was also no pre-teaching of the material; students did not receive a list of target vocabulary or a set of pre-listening instructions. While the benefits of pre-listening tasks are well documented (Morley, 1991; Rubin 1995), in this project students had to develop their own approach to each listening task or to select from the listening strategies covered in class to become more active learners (Peterson, 1991; Thanasoulas, 2000).

Each week students came to class with their printed document files and checked their answers with answer keys which were placed at the front of the class. Four sets of answer keys were provided so that students could check their answers quickly. After students had checked and corrected their homework, they submitted their work to the teacher, who recorded which units were completed for that week. This process took from 5 to 10 minutes. Since the grading of the project was based on the number of units completed per week, the scores students received for each unit were not recorded. We wanted students to focus on attempting as many units as they could and to be exposed to as much English as possible, rather than worry about how correctly they were completing the task. We also wanted to encourage students to attempt each type of listening material. If we recorded scores, students might have been hesitant to attempt the more difficult video lectures or applied listening questions. Lastly, recording scores would have been hard to tabulate into grades because of the range in difficulty of the units, the number of questions asked per unit, and the difference in the number of units students completed.

In the middle and near the end of the semester, students were told how many units they had completed, so that they could determine how many units they still needed to complete to receive the grade they wanted. However, students were limited to submitting a maximum of five units a week to avoid a scenario in which they might wait until the end of the semester to do the project. We felt it was important for students to be exposed to English throughout the term rather than from a burst of intensive exposure at the end.

At the end of the semester, students were given a posttest, the same 50-question TOEIC test administered at the beginning of the semester. Students were told that the posttest was not for a grade, but for assessing the usefulness of the project. Students also completed a survey to assess how they felt about the website, what types of listening materials they did and did not enjoy, how many times they visited the website each week, and how much time they spent on the homework each time they accessed the website.

**Procedure with Moodle**

In the 2nd year, the materials were imported to the Moodle platform. The activities and the content of the worksheets remained the same as the paper-based worksheets. The worksheet questions were simply imported into Moodle as quizzes. There were several reasons for this move. First, we wanted students to receive immediate feedback rather than wait to check the answer keys in class, which can be demotivating for students, as noted by Crooks (1988) and Sadler (1989). We felt this immediate feedback would encourage students to revisit the unit and allow them to better identify their mistakes. This
also eliminated the 5 to 10 minutes of class time that was required for students to check answers. We felt this was lost time, especially for students who had not done the homework or only completed one unit a week. It also brought what was essentially a self-study exercise into the classroom.

Second, we wanted more information about our students’ habits. Namely, we wanted to know how students accessed the website, whether they accessed the website once a week, completing all of their homework in a single session, or if they followed our advice and completed one unit per session. We also wanted to know how much time they spent on each unit. The instant correction of the activities allowed us to set a standard. When doing the paper-based activities, students received credit for completing each unit regardless of the score. On Moodle, it was believed that students’ performance on the posttest might be improved if students were forced to overcome a performance hurdle in order to receive credit for the assignment. A score of 80% was set as necessary for students to receive credit for completing a unit in the Moodle course.

Except for the differences of completing the task sheets online rather than on paper and needing to receive a minimum standard to receive credit for completing a unit, the procedure of the project was nearly identical. Students still did a pretest and posttest and the number of units students needed to complete for the desired grade remained the same. The only other noteworthy difference was that since students were already familiar with the Moodle system used by the university, it was thought that doing the first three activities as a class would be unnecessary. In the Moodle system, students worked independently from the beginning, without an orientation. The differences between the two modes can be seen in Table 1.

Table 1. Comparison of Wikispaces and Moodle Project Materials

<table>
<thead>
<tr>
<th></th>
<th>Paper-based (Wikispaces)</th>
<th>Moodle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest administered</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Class orientation to the website administered</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Number of different types of activities</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Number of activities per activity type</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Total Number of activities available to the students</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Type of activities</td>
<td>multiple choice, matching, fill-in-the-blank, cloze</td>
<td>multiple choice, matching, fill-in-the-blank, cloze</td>
</tr>
<tr>
<td>Format of activity</td>
<td>downloadable Microsoft word worksheet</td>
<td>online, self-correcting quiz</td>
</tr>
<tr>
<td>Manner / location of correction</td>
<td>self-corrected by students at the start of physical class</td>
<td>online</td>
</tr>
<tr>
<td>Passing score for each activity</td>
<td>None</td>
<td>80%</td>
</tr>
<tr>
<td>Minimum number of activities students must complete to receive a C for the project</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Posttest administered</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Results

The key data of the project is summarized in Table 2. The disparity between number of students participating in the Moodle project, 53, and the paper-based project, 96, is due to the fact that while students from two universities were able to use the paper-based activities, only one of the universities was using the Moodle system. In both the Moodle and paper-based projects, the number of students participating is small, less than 100 students.

One surprising point was that the average number of activities completed per student was greater for the paper-based project (35.7) than for the Moodle project (31.6). At first glance, it would seem that in terms of convenience of use, the Moodle project would be favored. In both cases, students had to access the Internet to complete the activity. With the paper-based activities, they had to download a worksheet and bring it to class to learn the correct answers. With Moodle, there were no papers to print out and bring to class, so it would seem that the Moodle activities would be easier to complete. Of course, students in the Moodle course had to receive a score of 80% or above in order for the activity to be considered completed. This hurdle seems to have had a profound effect on the ability of students to complete assignments.

It is also plausible that students were encouraged to complete more assignments for the paper-based project because they witnessed classmates submitting their homework each week. In effect, this could have created peer pressure to participate in the paper-based project or at least served as a weekly reminder. Teachers were also able to monitor student progress each week by witnessing who submitted homework and who did not for the paper-based project, presenting teachers an opportunity to remind or warn students who were not completing their homework. For the Moodle activities, students had no real way to compare their progress with other classmates and received fewer reminders to stay on task.

Table 2. Comparison of Students who Participated in the Moodle and Paper-Based Projects

<table>
<thead>
<tr>
<th></th>
<th>Moodle</th>
<th>Paper-based (Wikispaces)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students who took both pre- &amp; posttests</td>
<td>53</td>
<td>96</td>
</tr>
<tr>
<td>Average number of activities completed</td>
<td>31.6</td>
<td>35.7</td>
</tr>
<tr>
<td>Percentage of students who completed 45 or more activities to receive an A for the project</td>
<td>20%</td>
<td>57%</td>
</tr>
<tr>
<td>Average number of times students visited the site per week</td>
<td>0.7</td>
<td>1.5*</td>
</tr>
<tr>
<td>Average number of activities completed per visit</td>
<td>6.2</td>
<td>3*</td>
</tr>
<tr>
<td>Average number of times students attempted an activity</td>
<td>1.7</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Note: * indicates data collected from student survey

The results of the pretest and the posttest are summarized in Table 3. First, it can be seen that in neither case was there a particularly significant increase in students’ scores. The points of improvement in both the Moodle project or the paper-based project are well within the margin of error. It should be remembered that the posttest was only 15 weeks after the pretest. One semester might not be enough time to demonstrate significant changes in skills.
Table 3. Results of Pretests and Posttests

<table>
<thead>
<tr>
<th></th>
<th>Moodle</th>
<th>Paper-based (Wikispaces)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average / Median pretest score</td>
<td>27 / 24</td>
<td>22 / 21.8</td>
</tr>
<tr>
<td>Average / Median posttest score</td>
<td>28 / 27</td>
<td>24 / 24</td>
</tr>
<tr>
<td>Average change for students who completed none of the activities</td>
<td>-3.75</td>
<td>-3.1</td>
</tr>
<tr>
<td>Average change for students who completed more than 45 activities</td>
<td>4.5</td>
<td>1</td>
</tr>
<tr>
<td>Average change for students who attempted more than 45 activities:</td>
<td>5.4</td>
<td>NA</td>
</tr>
<tr>
<td>Average change for students who attempted 10 more activities than they completed:</td>
<td>6.85</td>
<td>NA</td>
</tr>
</tbody>
</table>

However, by examining the data a little more closely, several interesting points become apparent. Most gratifying is the fact that in both projects, students who did not complete any of the assignments showed no increase, but in fact showed a decline in their listening scores. This is significant in that non-English major university students often show a decline in their hours of English study after high school. In high school students are preparing for entrance exams and the amount of time studying English peaks. As 1st-year university students, they might have two English classes a week, and when they become 2nd-year students, this could drop to one class or none. Out of class listening activities such as the Listening Flood project may provide a way to preserve students’ English proficiency in the face of decreased class time by increasing the amount of exposure to English they receive outside of class.

For students who completed the 45 activities necessary to qualify for an A, the average change between pretest and posttest scores was not significant in either the Moodle-based project or the paper-based project. The paper-based project was completed a year before the Moodle project was initiated and the small difference between the two scores was known when the Moodle project was conceived. In fact, one of the motivating factors for incorporating the 80% correct hurdle into the Moodle project was that it was hoped students’ scores would improve. This did not turn out to be the case. In hindsight, we realize that by adding the 80% hurdle, completing the activities became more difficult. One possible explanation is that because only students with sufficient ability were able to complete 45 activities by the deadline, their skills were not much improved by the project. However, this idea is not supported by their pretest scores, which do not indicate a significantly higher level of ability than the other groups. This would explain the small amount of change between the pretest and posttest scores for students who completed 45 or more activities. It is also possible that the pretest scores do not reflect their ability. Table 4 summarizes the relationship between number of activities completed and the average pretest and posttest scores.

Table 4. Comparison Between Number of Activities Completed on Moodle with Pretest and Posttest Scores

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average pretest / posttest scores for Moodle students who attempted and completed none of the activities</td>
<td>25.25</td>
<td>21.5</td>
</tr>
<tr>
<td>Average pretest / posttest scores for Moodle students who completed 45 or more activities</td>
<td>21.1</td>
<td>25.66</td>
</tr>
<tr>
<td>Average pretest / posttest scores for Moodle students who attempted more than 45 activities</td>
<td>23.7</td>
<td>29.11</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Average pretest / posttest scores for Moodle students who attempted 10 more activities than they completed</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
</table>

|                                                                                                           | 24.6   | 31.4    |

There are signs of hope when analyzing the data from students in the Moodle project who attempted 45 or more activities but could not receive credit for all of them because they could not satisfy the 80% hurdle. Students who attempted more than 45 activities showed an improvement of more than 5 points. This, while still a small improvement, is statistically significant. Similarly, students who attempted at least 10 or more activities than they received credit for showed the greatest improvement. There were a small number of students who attempted many more activities than they were able to pass because of the 80% hurdle. In fact, six students attempted more than 45 activities, but were able to only pass the minimum 15. These students showed the greatest improvement.

The improvement of these low-level students is the most interesting. It seems to suggest that attempting is more important than succeeding in building proficiency. Where the students who completed 45 activities may have, prior to the project, already developed the skills necessary to complete the project, the students who failed to complete the 45 activities struggled and worked hard trying to complete the requirement. Through the process of this struggling, these students actually developed the skills that would improve their scores on the posttest.

The greater improvement of the low-level students, that is, students who either scored low on the pretest or who could not pass the 80% hurdle for many of the activities, suggests two possibilities that are not mutually exclusive. The first is that the process of attempting more activities spread out over several days had a more positive impact on the posttest scores. Students who attempted more than 45 activities accessed the Listening Flood website regularly, which is what we had originally envisioned. Research has shown that short bursts of listening tasks are more effective at improving listening than a single, lengthy session (Nation, 2009). Through failing more often than succeeding, students’ multiple attempts exposed them to more English input, which may, in turn, have led to greater improvement. This would support the position that frequent exposure to a target language coupled with focused activities can improve language proficiency, particularly for low-level language learners.

**Discussion**

As originally conceived, the purpose of this research project was to determine which of the two methods, paper or online, was most beneficial in improving students’ listening skills. In order to evaluate the effectiveness of these two methods, pretest and posttest scores were compared. However, students’ scores on the posttest indicated that there was not much difference in the change in average scores between the paper-based and Moodle-based projects. Neither format dramatically improved students’ listening ability. This could be due to the short time period covered, or it might indicate that even the amount of listening homework required by the project might be insufficient to dramatically improve students’ listening skills.

Even though the overall scores did not improve, the project raised a number of points of interest for teachers. First, requiring students to obtain scores of 80% and above in order to receive credit for the activity greatly reduced the number of students who completed 45 activities. On the one hand, this requirement reduced the number of students who reached the goal of completing 45 activities necessary to receive an A grade, but it increased the number of activities that lower-level students attempted. Attempting the activities seems more important than succeeding as students with more attempts scored
the highest average gains, regardless of number of activities successfully completed.

Interestingly, paper-based activities were not without their advantages. For example, having students bring the assignments to class each week greatly increased the number of activities completed each week. Online students waited until the end of the semester and tried to complete the activities all at once. Teachers considering introducing online, out-of-class activities need to be aware that without some reinforcement of the online activities within the class, students are likely to develop bad habits and wait until the end of the semester and try to complete the activities all at once, which is not optimal pedagogically.

To summarize our key conclusions:

• The effect of the listening project did not differ based on the format of the project.
• The peer pressure of correcting the worksheets in class appears to provide a powerful motivation for students to complete the project.
• Students seemed to benefit more from attempting rather than succeeding at the activities.
• Teachers should be aware that even students engaged in independent projects need monitoring and encouragement to continue working on the project.

Bio Data

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References


