
Short Research Papers

Student Perceptions of Auto-graded English Learning Activities

Robert Remmerswaal and Rachel Barington

Sojo University

This paper explores student perceptions of auto-graded activities used in a first-year English communications class. Due to restrictions related to COVID-19, an online curriculum was quickly developed in Moodle with a focus on independent learning. Some assumptions were made regarding student English ability and technology proficiency which led to the creation of five auto-graded activities to develop student listening, writing, pronunciation, and understanding of English. Student perceptions were gathered to determine the validity of assumptions made and to determine the usefulness of the auto-graded activities for future use. A mixed-methods survey gathered student perceptions of whether learning had occurred, the content level appropriateness, and the ease of use of the technology. This study found that all the activities led to most students believing they had improved a specific skill and recommending the activity be used again. Suggestions for improving each activity are given based on student feedback.

本論文では、1年生の英語コミュニケーションクラスで使用した自動採点のアクティビティに対する学生の認識を考察した。COVID-19による制限のため、Moodleでオンラインカリキュラムを迅速に作成し、自主学習に焦点を当てた。学生の英語力とテクノロジーの習熟度についてある程度仮定した上で、英語のリスニング、ライティング、発音、理解を深めるための5つの自動採点アクティビティを作成した。仮定の妥当性を検証し、自動採点アクティビティの将来的な有用性を判断するために、学生の認識を収集した。混合法による調査では、学びがあったかどうか、コンテンツレベルの適切性、テクノロジーの使いやすさについて尋ねた。本研究により、すべてのアクティビティにおいて、ほとんどの学生が何らかのスキルを向上させたと考え、そのアクティビティを再度使用することを推奨していることがわかった。また、学生からのフィードバックに基づき、各アクティビティを改善するための提案をここでやりたい。

The English curriculum at Sojo University is designed to include fun, accessible activities to increase student confidence in their English abilities (Sojo International Learning Center, n.d.). In 2020, due to the COVID-19 pandemic, adapting this curriculum was a challenge. Students who would normally take classes face-to-face (F2F) were forced into an online environment in what has been referred to as Emergency Response Teaching (ERT). A method of content delivery had to be planned and developed in a short amount of time. Across all ten departments at Sojo University (Appendix), the first-year English curriculum is required for all Japanese citizens. During this study, all F2F, student-student interaction was highly restricted, and the first five weeks of the English course (EC1) were taught online, an unexpected method of course delivery for both students and teachers.

To meet this challenge, content delivery was facilitated through the Moodle learning management system. Moodle was used in previous years for managing F2F classes, so it was already available. Moodle has many activity and resource types within the core version with additional plug-ins and embedding capability (Moodle, n.d.). When choosing specific activities and their difficulty level, the curriculum team considered the perspective of the students as Bates (2014) describes with his SECTIONS framework. This framework provides several areas of consideration for choosing the appropriate technology for the classroom. The following areas from the framework were unknown to the curriculum planners:

- What digital skills do you expect your students to have before they start the program? (Section 8.2)
- What principles do I need to use when designing multimedia materials for their most effective use? (Section 8.5)
- How intuitively easy to use, both by students and by yourself, is the technology you are considering? (Section 8.3)
- How reliable is the technology? (Section 8.3)

Most of the assumptions made by the curriculum team were related to students' English ability and technical proficiency. Some activities were easily tailored to the average student, such as writing assignments, due to the high

level of teacher input with grading. Auto-graded activities (a feature of Moodle), on the other hand, were not easily adjusted and remained unchanged during the semester. This study considered the accuracy of these assumptions to determine if the five auto-graded online activities (New Words, Quiz, Reading, Pronunciation, Dictation) could be used in subsequent years. The following research questions were asked.

1. How did students perceive learning with auto-graded activities?
2. How did activities meet the current English level of most students?
3. How easy was the technology for students to use?

The five auto-graded activities were chosen for three reasons. First, the technical aspects needed to be simple enough for the students to complete independently. Second, content difficulty needed to meet students at their current English proficiency. Third, activities needed to be possible to create within the Moodle system. While activities were designed under ERT constraints, they still took significant time and effort to make and are easily shared, modified, and re-used in future years. Therefore, findings may play a significant role in the design of future curricula.

The course required content made for independent learning that was appropriately levelled to challenge students while not overwhelming teachers with marking and feedback responsibilities. The validity of auto-graded activities and using student feedback to determine their success is discussed.

Feedback is important for students in regulating student learning (Barboza & da Silva, 2016). Students need to understand where they make mistakes to improve and make progress towards course objectives. Barboza and da Silva go on to summarize that feedback is most meaningful when it is given in a timely fashion. In determining what is timely, Bayerlein (2014) conducted a survey with undergraduate and graduate accounting students. He found that auto-generated feedback substantially improved student perceptions of feedback constructiveness. He also found that there were no significant changes in perceptions between timely feedback and extremely timely feedback. While some argue that auto-graded activities can be dehumanizing, they are also shown to be very accurate (Tang & Rich, 2017). With this understanding, 40% of the

grade came from automated activities. These auto-graded activities allowed for timely feedback, without teacher input during the course. Teachers could then allocate more time for other teaching responsibilities and provide timely, meaningful feedback on teacher-assessed activities.

Each English course at Sojo University has specific learning objectives but are unified with an overall goal for students to learn in a fun and accessible way. This goal is very subjective and dependent on the perceptions of students. In Social Cognitive Theory (Bandura, 1995), a person's belief in their ability to organize, execute actions, or manage a situation is more likely to affect behavior than a person's actual ability. With this understanding, student-reported learning could provide greater evidence of meeting that goal than learning demonstrated through a test.

Students have also been found to be accurate reporters of their learning. Eckerth (2005) showed that L2 learners can accurately report on learning specific words, structures, phrases, and expressions. Gravestock and Gregor-Greenleaf (2008) reported that students are suited to evaluate their own learning and areas that affect them. Gravestock et al. (2009) highlighted several studies that found students reliably and effectively evaluated teaching behaviors, the amount they have learned, the ease or difficulty of their learning experience in the course, the workload in the course, and the value of the assessments used in the course.

However, there are limitations within any survey tool, mainly that terms used within a survey may be interpreted different between students (Gravestock et al., 2009). For instance, when asking about technical difficulties, each student will have variable levels of acceptable difficulty, even among students with similar technical proficiency. Another area of consideration is that no matter the validity or reliability of an instrument, they can be misused or misinterpreted (Menges, 2000). Small differences can easily be given too great of importance.

To avoid the misinterpretation of results, the researchers used an inductive approach to determine the success of a particular activity, as recommended by Bates (2014). Inductive logic, as defined by the Stanford Encyclopaedia of Philosophy, should have the following Criterion of Adequacy,

As evidence accumulates, the degree to which the collection of true evidence

statements comes to support a hypothesis, as measured by the logic, should tend to indicate that false hypotheses are probably false and that true hypotheses are probably true.” (Hawthorne, 2021, para 2)

With nearly 800 students with varying English levels and activities chosen from necessity, using deductive reasoning is impractical. Enough evidence will be gathered from student responses, with the interpretations of the researchers who taught this curriculum, that a reasonable hypothesis of success or failure is likely to be true.

Methods

In course development, assumptions about the students and technology were made. It was expected that students would be using Moodle for the first time and for some, it would be the first time using a computer. Expectations were that digital skills would be quite low, but with a few guides, Moodle would be appropriately easy and become intuitive for the students. Similarly, the technology was assumed reliable. Material was designed in a repetitive way as it was assumed the most effective; technology would only need to be learned at the beginning of the semester. Assumptions in developing skills through these activities are discussed within each activity type.

Activities

Students were required to complete eight topic-based units, each with four sections. Within each section the same five activity types were repeated, each group of five centered around a primary text. For example, unit 1 was Self-Introduction and had four primary texts, one for each section. All activities came with a how-to guide that included screenshots with instructions in both English and Japanese. These activities are described as follows:

New Words: A Moodle plug-in by Poodll was designed to introduce 10-12 new vocabulary in each section. This iteration had five tasks, and students were given unlimited tries. First was to read a Japanese text and choose the corresponding English text from a pool of choices. Second, they were to listen to one of several selected Text-to-Speech (TTS) voices speak in English and type what they heard. Third, they read a Japanese text and typed the English

translation. Fourth, they completed a pronunciation task by recording their voice reading the written vocabulary. Finally, a random review of vocabulary learned in the course was given with Japanese text being matched to the equivalent English translation. It was assumed vocabulary would assist student working vocabulary and pronunciation.

Quiz: This utilized the H5P plug-in and was designed to increase listening skills and student understanding of the unit text. In part one, students had the option to review online flashcards of the vocabulary they studied in the New Words activity. In part two, students listened to various TTS voices reading the unit text and would drag and drop approximately 20 words to the appropriate blanks. Third, students answered a variety of comprehension questions. The entirety of this activity could be done an unlimited number of times within the two-week deadline of the unit.

Reading: The ReadAloud plugin by Poodll was used to create this task. This activity measured reading speed and accuracy. Students read a unit text with a one-minute time limit, at which point the recording would stop. AI auto-marked the words as correct or incorrect, and scores were based on number of words correct per minute. This started with unlimited attempts but was restricted to a single attempt after the first unit due to server capacity. The goal was to increase student reading fluency and pronunciation.

Pronunciation: This activity used a Speak the Words Set content type in the H5P plug-in. Students were prompted with a sentence in Japanese that they translated and spoke in English. The AI then evaluated the speech and transcribed what was understood. For each sentence, students had unlimited tries. The goal was for pronunciation to improve.

Dictation: The final activity was a simple dictation where students would listen to and type language from the unit. Like the pronunciation task, students would have unlimited tries. This task was embedded in a Moodle Page module, and the sentences were read by various TTS voices. Both listening and writing accuracy were the goals for these activities.

Assessment

A survey was given to all 789 first-year students across ten departments in the last three weeks of the spring 2020 semester. All participants provided informed consent in line with university research ethics procedures. A six-point Likert scale was utilized, eliminating neutral as an option.

The survey was designed to gather the student perspectives in the areas where assumptions were made. The survey questions were derived in English by the authors and translated by university staff. The student survey was in Japanese using Microsoft Forms to collect responses online. No personal information was collected. All students were asked their gender and their department, allowing for demographic-based analysis. All survey questions are listed in results (Figures 1-5).

Each activity had one or two stated learning goals; for each goal a survey statement asked for agreement that learning had occurred. This was in search for an answer to research question one: How did students perceive learning with auto-graded activities? The statements, “This activity was a good fit for my English level” and “This activity was below my English level” were asked for each activity to answer research question two: How did activities meet the current English level of most students? An assumption was made that a student who disagreed the activity was a good fit and disagreed the activity was below their English level would find the activity was too difficult. Likewise, disagreement with the first statement but agreement with the second led to the assumption the activity would be too easy.

The next two survey statements related to technology ease of use and technical difficulties in connection to research question three: How easy was the technology for students to use? They were followed by the final survey statement which recommended using the activity again next year. This final statement was an additional tool to measure the overall perception of an activity.

These Likert statements were repeated in five sections, one for each activity. An optional, open-ended question concluded each section. Open-ended questions were included for students to offer feedback on ways to improve the activity, make the content level more appropriate, and improve ease of use. These

written responses were translated with Google translation services, which has been shown to produce translations adequate for college level admission (Groves & Mundt, 2015) and was considered adequate for the purposes of this study. This feedback was useful for consideration when hypothesizing the usefulness of an activity.

Results

Of the 789 first-year students, 583 responded to the survey, giving a response rate of 73.9%. Overall, the results were positive, with most students agreeing, for all five activities, to their recommendation and to have learned or improved an English skill. When commenting, students were free to leave both positive and negative comments. Students often commented with only one type of comment, but when comments were both positive and negative, they were included in both totals.

New Words

From the Likert statements, nearly 95% of respondents agreed that their vocabulary increased, and 84% thought it was a good fit for their level (Figure 1). Of the 16% who disagreed, 11.3% found it too easy and 4.7% found it too difficult as determined by their subsequent responses to the statement, “This activity was below my English level”. Nearly three quarters of students agreed the technology was easy to use. Even so, nearly 60% of students reported having some sort of technical difficulty. Overall, 82.7% of students agreed with a recommendation to use the activity again the following year.

The comments provided some insight into these figures. A total of 442 students commented, with 245 positive and 224 negative comments. A common praise for the New Words activity was the words were learned and not just memorized. Many students also commented that the pronunciation section of the activity assisted in confirming the proper way to pronounce a word. Most negative comments centred around the pronunciation portion of the activity being too difficult, or a technical problem with the activity not understanding their accent. Some students commented that a native speaker pronouncing the word would have been more beneficial than the TTS voice provided. Others

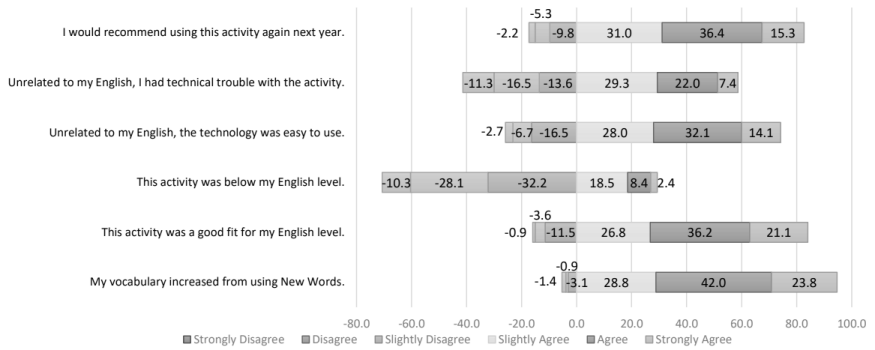


Figure 1. Reported agreement or disagreement to New Words.

complained the vocabulary was too easy for them. Finally, students complained of the computer calculating their score prematurely, which required a teacher to intercede and reset or manually change their score.

Quiz

This activity was also well received (Figure 2). A total of 87.8% of students agreed that the quiz assisted in improved understanding of the unit text. Similarly, 88% found that their listening skills improved using the Quiz activity. Of the 15.6% of students who disagreed that the activity fit their English level, 10.5% found it too easy and 5.1% found it too difficult. The technology was considered easy to use by 83.4% of students, and just over a quarter of students had technical trouble. Nearly 90% of students recommend it be used again.

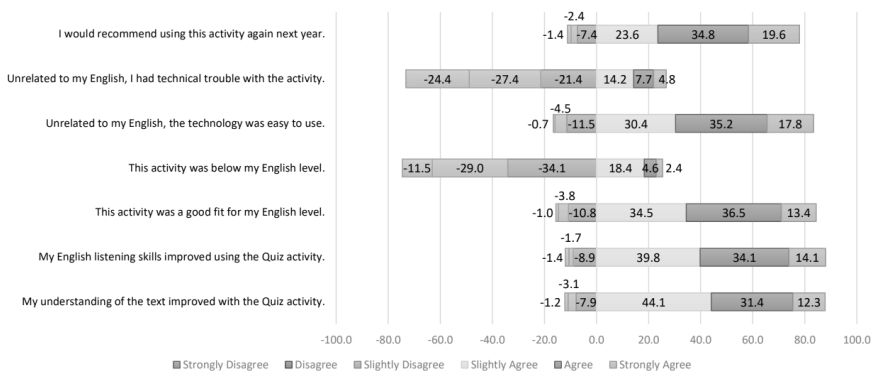


Figure 2. Reported agreement or disagreement to Quiz.

The comments were overwhelmingly positive. From the 385 total respondents, 309 were positive and 90 were negative. Many felt their listening skills had improved, and others felt that their experience was like a game. The few negative comments were related to difficulty in using the drag and drop functionality on their device and wanting a native speaker, rather than a Japanese person, to read the text. A few of the comments were related to students wishing for a simpler process of correcting their mistakes.

Reading

Students largely reported a positive reaction to this activity, with around 85% of respondents agreeing they would recommend it be used next year (Figure 3). Though a little less than half reported technical trouble, 80.4% found the activity was easy to use. Respondents reported agreement that their pronunciation and reading fluency improved by using this activity, 79.2% and 90.7%, respectively. Of the students who found the activity not at the proper difficulty level, 4.5% of total students found the activity too easy and 9.9% found it too difficult.

Of the 401 total written responses, 262 were positive and 161 were negative. Many of the negative comments related to an apparent unawareness of the one-minute time limit and believing there was a technical issue. The positive comments tended to focus on the activity increasing their reading speed and giving feedback that improved their pronunciation.

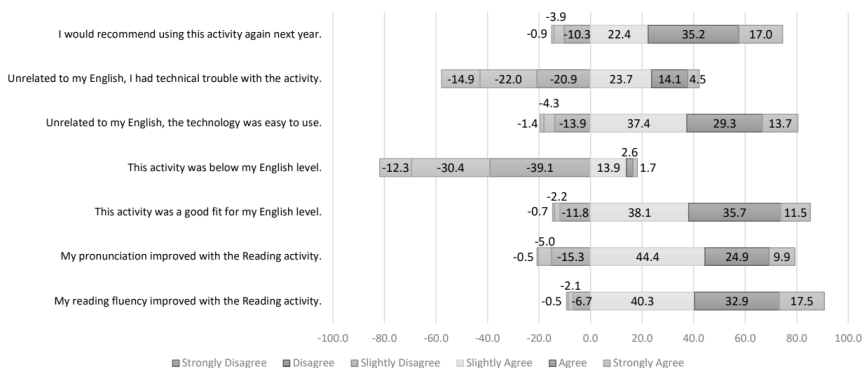


Figure 3. Reported agreement or disagreement to Reading.

Pronunciation

This activity only received 65.2% of student agreement to recommending it the following year. Three quarters of students believed it improved their pronunciation and was a good fit for their English level. Nearly 20% of students found the activity too difficult for them and 4.8% found it too easy. Just under 50% found it easy to use and 55% had technical trouble.

Much of the technical trouble alluded to in the Likert scale item refers to the voice recognition. Students claimed trouble with their microphones, too much extraneous noise in the background, and that the AI had trouble understanding them properly. This was the only activity with more negative feedback, 321 responses, than positive, 129 responses. The positive responses centered around the activity revealing where pronunciation mistakes were made and giving them confidence in their pronunciation ability.

Dictation

Responses to this task were largely positive, with 91.9 % of students reporting improvement in listening and 88% in writing (Figure 5). Appropriateness of level had 84.6% agreeing. This left 11% of students finding it too difficult and 4.4% finding it too easy. 87.3% of students agreed in recommending the activity be used again.

Of the technical difficulties, many were related to the auto-grading feature misreading items like punctuation, most likely connected to the different

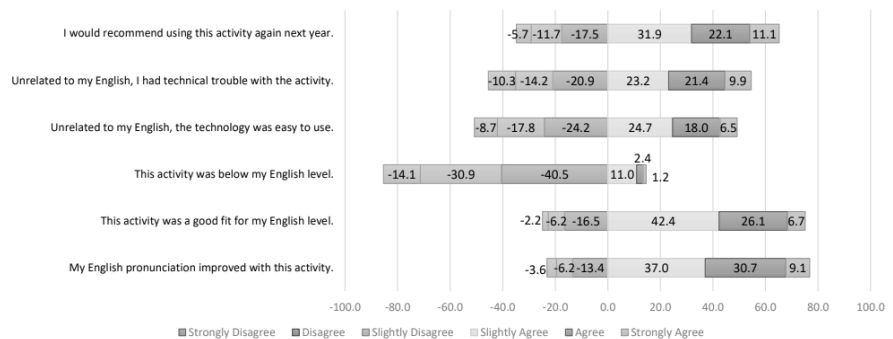


Figure 4. Reported agreement or disagreement to Pronunciation.

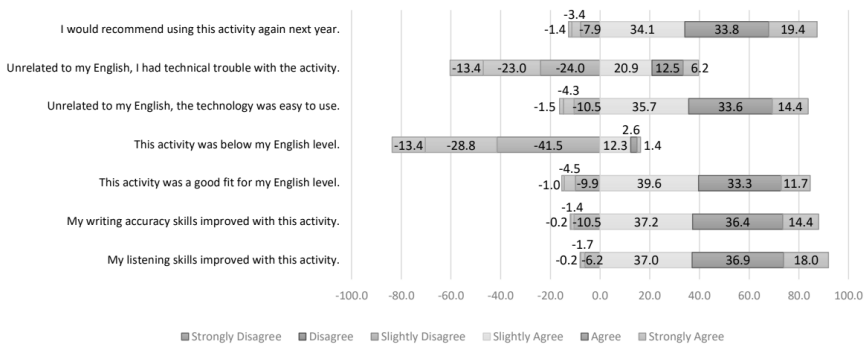


Figure 5. Reported agreement or disagreement to Dictation.

apostrophes used on English and Japanese keyboards. Some students reported difficulty hearing as well. One of the largest complaints was related to navigation and the desire to easily proceed to the next empty space (these students seemed unaware of the tab key function). Again, positive comments were the majority with 267 compared to 127 negative comments. Positive comments centered on the activity being a good way to practice listening, spelling, and typing.

Department Results

Results by department have been broken down as averages across all five activity types (Table 1). Any department average that was ten percent higher or lower than the overall average has been noted in the table.

The different categories break down as follows. Test score shows the average score on the English proficiency test given at the beginning of the semester. This is a multiple-choice test for listening and reading comprehension. Short names for the departments were used with full names listed below (Appendix). Learning is the percent of responses that agreed learning occurred averaged across all activities. Right Level is the percent of responses that agreed the activities were the proper level for them averaged across all activities. Ease of use is the percent of responses that agreed activities were easy to use averaged across all activities. Tech issues is the agreement that technical difficulties occurred averaged across all five activities. Recommend is the percentage of students who agreed that they would recommend an activity taken averaged across all activities.

Table 1
Average Levels of Agreement, Broken Down by Department

Department	Test Score	Total Students	Total Responses	Learning	Right Level	Easy to use	Tech issues	Recommend
Pharma	73.9	127	109	90.9	85.5	78.0	44.4	87.2
Aero	60.1	88	60	86.7	68.0	71.0	46.3	76.7
Arch	57.5	72	49	89.5	87.3	81.6	47.8	82.0
LifeSci	56.8	86	60	87.1	73.3	73.7	43.7	81.3
BioTech	55.4	70	50	89.0	68.4	70.4	52.4	82.4
CIS	54.3	144	111	83.6	76.0	69.4	42.9	77.5
Design	52.8	53	33	88.6	70.3	79.4	38.8	88.5
Nano	51.5	56	47	88.0	71.1	78.7	35.3	85.1
MecEng	50.0	69	49	81.1	78.8	66.1	46.9	75.1
Art	45.3	24	15	88.3	68.0	85.3	44.0	90.7
All	57.8	789	583	87.2	82.7	74.2	44.4	81.8

Note: Averages in a department that were 10% higher or lower than the overall average are given in bold.

The departments of Aero, BioTech, Design, Nano, and Art were all marked for being lower than the average in the Right Level category. MecEng was the least likely to find the technology easy to use, while the Art department was the most likely to find it easy. Design was the least likely to agree to having technical issues, while BioTech was the most likely. Finally, Art was the most likely to recommend the activities be used again, and MecEng the least likely.

Discussion

Determining an appropriate difficulty level of an activity from student perceptions is challenging, as each teacher or institution is likely to have their own opinion as to what is an acceptable percentage of students who find the task too easy or too

difficult. Departments like Pharma with a high proficiency were likely to claim activities were appropriately levelled, which would suggest no changes needed. Where some departments, like MecEng, with a lower English proficiency score claimed the activities were too easy.

Of interest to the researchers were the percentage of students who found an activity too easy compared to the percentage who found it too difficult. Student responses to both New Words and Quiz had nearly double the percentage of students who found it too easy compared to those who found it too difficult. Reading and Dictation was the opposite with nearly double the percentage of students finding it too difficult when compared to those who found it too easy. Pronunciation had nearly 20% of students believing the activity was above their English level. This was more than four times those who found it too easy. These differences between easy and difficult may prove useful when considering how to alter activities to better meet the English level of most students.

Determining the overall ease of use of technology is difficult to categorize as a binary easy or not easy. None of the activities were considered easy to use by all users, showing an opportunity for improvement. Similarly, as students agreed that technical problems occurred, there are problems to address. Departments were also likely to have had differences in technical proficiency, as departments with similar English proficiency were dissimilar in their agreement to ease of use.

The New Words activity, with which nearly 60% of students reported having technical problems, had comments centred on the pronunciation aspect. Students reported difficulties with the voice recognition software. This may require more teacher instruction, or clarity with the goals and objectives of the activity. Similarly, a teacher was required to manually reset scores which likely lowered agreement with ease of use. If that system error continues, an alternative plug-in may be preferable.

The Quiz activity had the least number of technical difficulties reported and the most agreement with ease of use. There could be some improvement to the drag and drop feature, but with such high agreement to the ease of use, the level could be deemed acceptable without changes.

Reading was also highly rated as easy to use. However, increased teacher

explanation of the one-minute limitation and reasoning is recommended. There was also a server issue during the semester. Despite its resolution, it was likely considered when students completed surveys.

Pronunciation was considered the least easy to use and had the second highest agreement to having technical difficulties. Once again, increased teacher input and explanation could resolve some issues. Some students struggled to use the Chrome browser despite its requirement. Other browsers functioned for all other activities, but proper functioning of the Pronunciation microphone input required Chrome. Students possibly assumed their microphone was broken and did not change their browser. Some students felt the transcription technology was broken because of the strange transcriptions. While transcriptions were far from what students attempted to speak, the technology was functioning properly. To address this, the software developer has made a change to compare pronunciation to the correct answer, rather than all words in the English language. This should reduce the issue and lower the difficulty as well. Ideas to make the level more appropriate include eliminating the translation element and to provide an opportunity to shadow passages before attempting the recording.

Finally, Dictation was also considered easy to use but had a high number of technical difficulties at 40%. This activity was highly recommended for future use, so these issues should be explored. The only suggestion is to use a different plug-in to create a similar activity.

Some of the technology problems could have been easily solved with increased communication between teachers and students. Perhaps conducting a survey in the first few weeks of the semester would have remedied the minor technical difficulties and opened the lines of communication between teachers and students.

Conclusion

Overall, including Pronunciation and its associated difficulties, these tools can be considered successful and with some modification could encourage deeper learning. It is important to point out that these tools are assistive in nature and cannot be the sole means of feedback or input for students to improve their

English.

In answering the first question, did learning occur from using the auto-graded activities, most students agreed to these statements. While there were some complaints and ideas on how to make improvements, learning seems to have occurred and, in some areas, even more than expected. As seen with students reporting so positively about learning the words and not just memorizing them.

The second question is a little more difficult to answer. For the majority of students, the activities were perceived as appropriately levelled. Four activities fall into acceptable levels of perceived ease and difficulty according to the student feedback, but Pronunciation does not. Pronunciation should be revised to be less difficult.

Concerning the third question, there is room to improve technology usability. Most students reported having technical issues, and most negative comments were reflective of these problems. The Quiz activity appeared to be the easiest to use but could still use adjustments. All other activities may require more detailed explanations, changing of settings, or other considerations to make improvements. Students were none the less able to complete all activities.

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Author bios

Robert Remmerswaal is a teaching professional in the Kumamoto area. He has an interest in increasing student confidence in their English ability. His teaching often includes technology and using real-life situations to keep students engaged. robertr@m.soyo-u.ac.jp

Rachel Barington is a senior assistant professor at Sojo University where she currently teaches first-year English Communication courses. Her research interests include teaching and evaluating speaking, vocabulary acquisition, intercultural communication, and CALL. rachelb@m.soyo-u.ac.jp

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Appendix

Faculty	Department	Short Name
Pharmaceutical Sciences	Pharmaceutical Sciences	Pharma
Engineering	Aerospace Systems Engineering	Aero
Engineering	Architecture	Arch
Biotechnology and Life Science	Applied Life Science	Life
Biotechnology and Life Science	Applied Microbial Technology	BioTech
Computer and Information Sciences	Computer and Information Sciences	CIS
Art	Design	Design
Engineering	Nanoscience	Nano
Engineering	Mechanical Engineering	MecEng
Art	Fine Arts	Art

Note: Data from www.sojo-u.ac.jp/en/faculty/